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# On species of the *Elachista bedellella* group (Gelechioidea, Elachistidae, Elachistinae) similar with *E. rudectella* Stainton, 1851 and *E. graeca* Parenti, 2002, with descriptions of five new species

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**Abstract.** The species of the *Elachista bedellella* group with their male genitalia similar with those of *E. graeca* Parenti, 2002 and *E. rudectella* Stainton, 1851 are treated. The species share the presence of a cornutus in the male vesica. We restrict species here treated further by the shape of the juxta lobes. The species assemblage considered here apparently does not form a monophylum. The rationale is to narrow down the large group of unrevised species to more manageable units using distinctive characters. Known and named species close to the ones treated here are included in the diagnoses. Twelve species are here treated in detail, five of which are described as new: *Elachista belona* Kaila & Sruoga, **sp. nov.** (Russia: Tuva), *E. granicorna* Kaila & Sruoga, **sp. nov.** (Tajikistan), *E. lagotara* Kaila & Sruoga, **sp. nov.** (Turkmenistan), *E. phantasma* Kaila & Sruoga, **sp. nov.** (Kyrgyzstan) and *E. scolopsa* Kaila & Sruoga, **sp. nov.** (Lebanon). The females of *E. multipunctata* Sruoga, 1990, *E. graeca* Parenti and *E. derbendi* Parenti, 1981 are described for the first time.

## Introduction

Elachistinae (Elachistidae) are a group of small-sized moths with inconspicuous wing patterns. In the world catalogue Kaila (2019) recognized 673 species belonging to *Elachista* Treitschke, 1833, the largest genus in this subfamily. Since this work, 21 further species have already been added to the genus (Nel and Varenne 2019, 2021; Sruoga et al. 2019; Varenne and Nel 2020; Sruoga 2021, 2022; Grange et al. 2023; Sruoga and Havelka 2023; Kaila and Huemer 2024; Kosorín and Tokár 2024), one species raised from synonymy (Kaila and Huemer 2024), and three new synonymies established (Buschmann and Pastorális 2019; Huemer and van Nieukerken 2021). The total number of *Elachista* species known before the present contribution is thus 692.

The genus *Elachista* was divided into four subgenera by Kaila (1999a), and a fifth was added by Kaila and Sugisima (2011). The subgenera have further been divided into species groups in a series of

† Deceased.

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articles. They are summarized, with virtually all *Elachista* species placed in some species group, in Kaila (2019). The species treated here belong to the *Elachista bedellella* group in the subgenus *Aphelosetia* Stephens, 1834. This grouping follows that of Kaila (2007), as opposed to the concept introduced by Traugott-Olsen and Nielsen (1977) and refuted by Albrecht and Kaila (1997) and Kaila (1997).

The *E. bedellella* group is characterized by a dorsally projected funnel-shaped appendix in the median plate of the juxta. An appendix is also present in the *E. dispilella* group and *E. dispunctella* group sensu Kaila (2015) and Kaila et al. (2015) in which the appendix is narrower, deeper and tongue-shaped. The separation of these species groups is further elaborated by Kaila et al. (2015). The *E. bedellella* group consists of 50 species hitherto considered as valid, but many more await description, and the identity of several existing names is not clarified. Parts of the *E. bedellella* group have been revised by Kaila (2007, 2011b, 2011c). The species considered here share the combination of the medially bluntly produced juxta lobes (Figs 31–46) and the presence of a cornutus in the phallus. Combination of both these characters differentiates them from the *E. bedellella* species complex, the species of which have sickle-shaped juxta lobes (Kaila 2007) and the members of *E. catalana* species complex which have a cornutus (Kaila 2011b). These two species complexes are distinguishable from the species treated here by the shape of their juxta lobes as not being medially produced. In the diagnoses of the species the relevant taxa are included. The group of species treated in the present paper is partially an artificial assembly, only united by the presence of a cornutus in the male genitalia. The view of this grouping being artificial is supported by DNA barcodes (dx.doi.org/10.5883/DS-ELACGRAE), as well as on the basis of some details in morphology. For instance, although the male genitalia of *Elachista ohridella* Parenti, 2011 and *E. laurikailai* Varenne & Nel, 2020 closely resemble those of *E. nolckeni* Šulcs, 1992, these species are excluded from the present contribution because of the lack of a cornutus. They are, however, considered in the diagnosis of *E. nolckeni*. We apply the same approach to some other species as well. In spite of these shortcomings, we consider the publication of the present contribution useful as a step in the process of revising the extremely challenging *E. bedellella* group by segregating it into manageable units, natural or not.

In the present contribution, 12 species are treated, five of which are described as new.

## Materials and methods

This publication is based on preserved specimens deposited in both public and private collections. All holotypes currently deposited in private collections will be preserved in public collections as specified under each species.

### Abbreviations for depositories

| | |
|---|---|
| **MHN** | Muséum d'histoire Naturelle, Genève, Switzerland |
| **MIZT** | Università di Torino, Italy |
| **MZH** | Finnish Museum of Natural History, Helsinki, Finland |
| **NHMW** | Naturhistorisches Museum Wien, Austria |
| **RCJJ** | Research collection of Jari Junnilainen, Finland |
| **RCJPK** | Research collection of Jari Kaitila, Finland |
| **RCNupp** | Research collection of Kari and Timo Nupponen, Finland |
| **SZMN** | Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia |
| **TLMF** | Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria |

| | |
|---|---|
| **VU** | Zoological museum, Vilnius University, Lithuania |
| **ZISP** | Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia |
| **ZMUC** | Zoological Museum of the University of Copenhagen, Denmark |
| **ZMKU** | Zoological Museum, Kyiv Taras Shevchenko National University, Kyiv, Ukraine |
| **ZSM** | Zoologische Staatssammlung München, Germany |

The terminology follows the standard work of Traugott-Olsen and Nielsen (1977), with some modifications by Kaila (1997, 1999a, 2011a). 'Digitate processes' refer to the lateral, distally setose lobes attached either to juxta, the membrane between the juxta and the valva, or rarely entirely fused to valva (Kaila 1999b). It is a term that has been universally used in the *Elachista* literature since the seminal work of Traugott-Olsen and Nielsen (1977). The homology of such lobes with those appearing in many groups of Gelechioidea is to some extent questionable. They may be homologous to similar-looking structures present in some other gelechioid groups, but not necessarily in all (Kaila 1999a, 2004; Heikkilä et al. 2014; Kaila et al. 2019), and various terms have inconsistently been applied for them in different families.

To stain the male genitalia, an aqueous solution of red (yellow) eosin was used. The abdominal pelt of male specimens, and both the abdominal pelt and the genitalia of female specimens, were gently stained using chlorazol black E. Redescriptions are given to the previously described species, due to the superficial nature of most previous accounts. Wingspan was measured to the tips of the fringe scales at the apex.

Permanent slides were prepared using Euparal as mounting medium. Many genitalia stored in VU are preserved on a slip of carton on the same pin as the specimen in a drop of crystallized sugar. No dissection number is provided for them.

Other illustrations of genitalia were edited, and the plates of each specimen assembled using CorelPHOTO-PAINT, included in CorelDRAW Graphics suite 2022–2024. Comparison of the length of the phallus in relation to the valva was measured as the longest line from the base of the sacculus to the apex of the cucullus. In the assembled male genital plates the true length of the phallus as compared with other parts of the genitalia is shown in the left side of the genitalia. The magnified images of the phallus and the juxta do not reflect their relative sizes. The same applies to the part of the plates showing whole genitalia with phallus. These images are not in the same scale between images made of different specimens. As the size of the genitalia closely correlates with the size of the specimen (authors, personal observations), the wingspan can be used as a proxy for the relative sizes of the genitalia of the species treated.

**Molecular analysis**

DNA Barcode Gap Analysis: The sequence used was the standard DNA barcode, i.e., CO1-5P Cytochrome Oxidase Subunit 1 5' Region. The data available was restricted to the Palearctic region. In total, it comprises 5180 *Elachista* records, with 4362 sequences meeting requirements applied here. The DNA barcode distance analysis was done using all public *Elachista* data on BOLD. For alignment of sequences BOLD aligner (Amino Acid based HMM) was used. The data Pairwise Distance (p-distance) model for nucleotide substitution was used as the model for measuring genetic divergences. Only sequences with at least 200 base pairs were used. Records containing stop codons, misidentification or error -flags as well as contaminated records were excluded from the analysis. Ambiguous bases were handled with Pairwise Deletion. The distances for Nearest Neighbors were measured using a species pool of 259 *Elachista* species.

Further details of sequenced material including complete voucher data and images of specimens can be accessed in the public dataset DS-ELACGRAE "*Elachista* species similar to *Elachista graeca*" https://dx.doi.org/10.5883/DS-ELACGRAE.

## Results

### Checklist of species in the *Elachista bedellella* group similar to *E. rudectella* and *E. graeca*

1. *Elachista afghana* Parenti, 1981
2. *Elachista multipunctata* Sruoga, 1990
3. *Elachista phantasma* Kaila & Sruoga, sp. nov.
4. *Elachista granicorna* Kaila & Sruoga, sp. nov.
5. *Elachista graeca* Parenti, 2002
6. *Elachista lagotara* Kaila & Sruoga, sp. nov.
7. *Elachista latipenella* Sinev & Budashkin, 1991
8. *Elachista scolopsa* Kaila & Sruoga, sp. nov.
9. *Elachista belona* Kaila & Sruoga, sp. nov.
10. *Elachista derbendi* Parenti, 1981
11. *Elachista rudectella* Stainton, 1851
12. *Elachista nolckeni* Šulcs, 1992

### Key to males

1 Juxta lobes sickle-shaped ..... ***E. bedellella* species complex** (see Kaila 2007)
– Juxta lobes not sickle-shaped ..... **2**
2 Juxta lobes not medially produced ..... ***E. catalana* species complex** (see Kaila 2011b)
– Juxta lobes medially produced ..... **3**
3 Juxta lobes distally widened and conical; phallus with a spine near apex (Fig. 45) ..... ***E. rudectella***
– Juxta lobes not distally widened; no spine near apex of phallus ..... **4**
4 Costa of valva nearly straight; phallus strongly widened at apex: widest point at apex about 1.6 times wider than the widest point at base (Fig. 40) ..... ***E. latipenella***
– Costa of valva distinctly convex medially; phallus at apex equal to or narrower than its base ..... **5**
5 Cornutus faintly visible, length up to 0.4 width of phallus at its middle (Figs 34, 35) ..... ***E. phantasma***
– Cornutus distinctive, length more than 0.5 width of phallus at its middle ..... **6**
6 Vesica apically with a group of small granules (Fig. 36) ..... ***E. granicorna***
– Vesica apically without a group of small granules ..... **7**
7 Median margin of juxta convex at obtuse angle beyond the middle ..... **8**
– Median margin of juxta not convex at obtuse angle beyond the middle ..... **9**
8 Uncus lobes tapered towards pointed apex; cornutus strongly bent, sickle-shaped (Fig. 46) ..... ***E. nolckeni***
– Uncus lobes as long as broad, distally round; cornutus not bent (Figs 42, 43) ..... ***E. belona***
9 Cornutus strongly curved, C-shaped (Fig. 44) ..... ***E. derbendi***
– Cornutus more or less straight, not C-shaped ..... **10**

10 Long incision separating uncus lobes 0.5 length of uncus (Fig. 31)..... ***E. afghana***
– Short incision separating uncus lobes at least 0.6 length of uncus ..... **11**
11 Phallus dorsally concave in distal third and apex bent to ventral direction (Fig. 41)..... ***E. scolopsa***
– Phallus dorsally not concave in distal third and apex not bent to ventral direction..... **12**
12 Length of cornutus 0.4 × of phallus; uncus lobes tapered towards pointed apex (Fig. 37) ..... ***E. graeca***
– Length of cornutus about 0.2 × of phallus; uncus lobes not tapered, apically round..... **13**
13 Juxta lobes widely separated from each other with V-shaped incision, median margin somewhat convex; apical tooth of cornutus approximately 1/3 of cornutus (Figs 38, 39) ..... ***E. lagotara***
– Incision separating juxta lobes narrow, median margin somewhat concave; apical tooth of cornutus approximately 1/2 of cornutus (Figs 32, 33)..... ***E. multipunctata***

**Key to females**

(females of the following species are unknown and not included in the key: *E. afghana*, *E. phantasma*, *E. granicorna*, *E. latipenella* and *E. scolopsa*).

1 Colliculum with longitudinal folds ..... **2**
– Colliculum without longitudinal folds ..... **5**
2 Ductus bursae gradually joining the corpus bursae without a distinct border (Fig. 49) .... ***E. lagotara***
– Ductus bursae joining corpus bursae with a more or less distinct border..... **3**
3 Corpus bursae almost rounded, with a width/length ratio of approximately 0.75 (Fig. 52)..... ***E. rudectella***
– Corpus bursae oval, with a width/length ratio of approximately 0.4..... **4**
4 Colliculum bulbous, 4/5 as long as apophysis posterioris; apophysis anterioris approximately 0.5 × as long as apophysis posterioris; corpus bursae with internal spines that are not arranged into bands (Fig. 48)..... ***E. graeca***
– Colliculum almost as long as apophysis posterioris; apophysis anterioris approximately 0.6 times as long as apophysis posterioris; corpus bursae with internal spines arranged in broad bands (Fig. 47) ..... ***E. multipunctata***
5 Corpus bursae with rounded, laterally somewhat dentate signum (Fig. 50)..... ***E. belona***
– Corpus bursae without rounded signum..... **6**
6 Ductus bursae without internal spines; corpus bursae nearly rounded (Fig. 54).... ***E. nolckeni***
– Ductus bursae with internal spines; corpus bursae oval (Fig. 51) ..... ***E. derbendi***

### *Elachista afghana* Parenti, 1981

Figs 1, 31

*Elachista afghana* Parenti, 1981: 54. Type locality: Afghanistan: Paghman.

**Material examined.** ***Holotype.*** AFGHANISTAN • ♂; Paghman, 30 km NW Kabul; 35.62°N, 68.71°E; 20–22 Jul. 1963; Kasy & Vartian leg.; prep. U. Parenti 1047, Mus. Vind. 11055; NHMW.

***Paratype.*** Slides: AFGHANISTAN • ♂; Band-e-Amir, 3000 m; 34.85°N, 67.23°E; Gen. prep. U. Parenti 967; wing prep. A.17.7.86 E. Traugott-Olsen, from the same specimen, Kasy & Vartian leg., Mus. Vind. 11105; NHMW. Specimen not available for study.

**Diagnosis.** *E. afghana* is a large and lightly-coloured species with indistinct forewing markings. In male genitalia, it closely resembles *E. multipunctata*. The main differences between these two species are: 1) the incision separating the uncus lobes is short, approximately 0.5 the length of the uncus, whereas it is approximately 0.6 in *E. multipunctata*; 2) the apical tooth of the cornutus is approximately 2/3 the length of the cornutus, while in *E. multipunctata* it is approximately 1/2 the length of the cornutus.

**Redescription.** Wingspan 12.0 mm. Labial palpus 1.2 × diameter of head, creamy white, with some grey scales below. Head, neck tuft, tegula, thorax, scape and pedicel of antenna creamy white; flagellum grey, weakly annulated with paler rings. Foreleg grey with tarsal articles distally white, legs otherwise off-white. Forewing white with concolorous fringe, sparsely scattered with grey-tipped scales, forming dark grey fringe line. Hindwing pale grey with concolorous fringe. Underside of forewing yellowish grey with concolorous fringe, underside of hindwing pale grey.

***Male genitalia.*** Uncus lobe 1.5 × as long as broad at its broadest point, distally round, with a few short setae distolaterally, incision separating uncus lobes half the length of uncus. Spinose knob of gnathos about as long as broad. Valva 3.5 × as long as broad at its broadest point in the middle; costa strongly convex medially, distinctly emarginated in its distal third; sacculus basally slightly convex, weakly concave beyond middle; cucullus round, weakly bent towards costa. Digitate process small, about 1/6 length of valva, basally narrow, distally dilated, bent to posterior direction, setose. Juxta lobes widely separated from each other, medially produced forming lobes somewhat longer than broad, bottom of incision between juxta lobes strongly sclerotized; median margin of lobes somewhat concave; distal margin with a few short setae; lateral process long and broad; lateral margin concave; median plate with shallow dorsally directed median sac. Vinculum small, with short narrow saccus strongly bent dorsad. Phallus about 0.7 × as long as valva, straight, 5–6 × as long as broad at its broadest place near base, distally slightly narrowed beyond prominent lateral swelling at distal third; caecum short, round; vesica with one straight or weakly bent cornutus formed as elongate tooth arising from short, sclerotized plate, length of cornutus about 0.1–0.2 × length of phallus.

**Female.** Unknown.

**Biology.** Host plant unknown. Based on the specimen available, adults fly in July.

**Distribution.** Afghanistan.

## *Elachista multipunctata* Sruoga, 1990

Figs 2–5, 32, 33, 47, 55, 56

*Elachista multipunctata* Sruoga, 1990: 79. Type locality: Tajikistan, 30 km N Dushanbe.

**Material examined.** ***Holotype.*** TAJIKISTAN • ♂; 30 km N. Dushanbe, Kondara (Fig. 55); 38.80888°N, 68.81811°E; 20 Aug. 1986; R. Puplesis leg.; L. Kaila prep. 6160; VU.

***Other material.*** TAJIKISTAN • 2 ♂; Zardolu, NW Nurek; 38.49°N, 69.17°E; 6 Aug. 1990; • 1 ♂, 1 ♀; 1 Jul. 1991; V. Sruoga leg.; VU; • ♀; 30 km N. Dushanbe, 1200 m, Kondara; 38.80888°N, 68.81811°E; 5 Jul. 1986; Puplesis leg.;

VU; • 1 ♂; same locality; 18 Jul. 1989; • 13 ♂, 6 ♀; same locality; 3 Jul.–10 Aug. 1990; • 10 ♂, 4 ♀; same locality; 13 Jun.–6 Jul. 1991; gen. prep. V. Sruoga 157 (♀), L. Kaila 1658 (♂); all V. Sruoga leg.; VU, 1 ♂ 1 ♀ MZH; • 1 ♂; same locality; 4 Sept. 1990; R. Noreika leg.; VU; • 1 ♂; W. Pamir Mts., 2550 m, Vanch River Valley, Pol-Mazar Village, 6 km E Vanch Nature Reserve; 38.4011°N, 72.0131°E; 28–29 Jul. 2013; K. Nupponen & R. Haverinen leg.; DNA sample FinBOL 2021, http://tun.fi/NH.472; RCNupp.; • 1 ♂; same collection data; L. Kaila prep. 6152, DNA sample FinBOL 2021, http://tun.fi/NH.471; MZH; • 3 ♂, 1 ♀; same collection data; 1 ♂ L. Kaila prep. 6156; RCNupp.

TURKMENISTAN • 1 ♂; Kugitangtau Mountains, env. Svinsovy Rudnik, Sayat (Fig. 56); 37.55026°N, 66.29295°E; 29 Aug. 1990; R. Puplesis; VU.

**Diagnosis.** Superficially and by male genitalia, this species is similar with *E. afghana*. The identification of these species is given in the diagnosis of *E. afghana*. In the female genitalia, *E. multipunctata* resembles *E. graeca* in its wide colliculum with longitudinal folds and oval corpus bursae. These two species can be distinguished as follows: 1) the colliculum in *E. multipunctata* is as long as apophysis posterioris and gradually tapered, whereas in *E. graeca* it is about 4/5 the length of the apophysis posterioris and bulbous; 2) the corpus bursae in *E. multipunctata* with internal spines arranged in broad bands, whereas in *E. graeca* the internal spines are not arranged in bands.

**Redescription.** Wingspan 9.5–12.0 mm. Labial palpus as long as diameter of head, white to off-white. Head, neck tuft, tegula, thorax, scape and pedicel of antenna white to off-white; flagellum grey. Foreleg grey with tarsal articles distally white, legs otherwise off-white. Forewing ground colour off-white with concolorous fringe, sparsely scattered with grey-tipped scales, often darker grey pattern in middle of wing, and forming dark grey fringe line. Hindwing pale grey with concolorous fringe. Underside of forewing yellowish grey with concolorous fringe, underside of hindwing pale grey.

***Male genitalia.*** Uncus lobe as long as broad at its broadest point, distally round, with a few short setae distolaterally, incision separating uncus lobes 0.6 × length of uncus. Spinose knob of gnathos about 1.5 × as long as broad. Valva 3.5–4 × as long as broad at its broadest point in the middle; costa strongly convex medially, distinctly emarginated in its distal third; sacculus basally somewhat convex, slightly concave beyond middle; cucullus somewhat curved and weakly bent towards costa. Digitate process small, about 1/5 length of valva, basally narrow, distally dilated, blunt and setose, ventral margin convex. Juxta lobes widely separated from each other, medially produced forming lobes 2 × as long as broad, bottom of incision between juxta lobes strongly sclerotized; median margin of lobes somewhat concave; distal margin with a few short setae; lateral process long and broad; lateral margin concave; median plate with shallow dorsally directed median sac. Vinculum small, with short narrow saccus strongly bent dorsad. Phallus about 0.7 × as long as valva, straight, 5–6 × as long as broad at its broadest place near base, distally slightly narrowed beyond prominent lateral swelling at distal third; caecum short, round; vesica with one straight or weakly bent cornutus formed as elongate tooth arising from short, sclerotized plate, length of cornutus about 0.1–0.2 × length of phallus.

***Female genitalia.*** Papilla analis membranous with nearly round apex; ventrally connected with inverted Y-shaped sclerotization. Apophysis posterioris about 2 × as long as papilla analis; apophysis anterioris approximately 0.6 × as long as apophysis posterioris. Ostium bursae broad, round. Colliculum almost as long as apophysis posterioris, broad, 1/3 as wide as long, with longitudinal folds. Remaining part of ductus bursae about 1.5 × as long as colliculum, membranous, with small internal spines, especially towards corpus bursae. Corpus bursae oval, with small internal spines arranged as broad bands.

**Biology.** Host plant unknown. The species has been collected at light, at elevations of 1000–3000 m from mid-June until early September. The collecting dates suggest the presence of two generations.

**Distribution.** Tajikistan, Turkmenistan.

**DNA barcode information.** Intraspecific divergence distance (n = 2) 0.15% (sample id's: DNA sample FinBOL 2021, http://tun.fi/NH.472; DNA sample FinBOL 2021, http://tun.fi/NH.471) Nearest neighbor is *E. phantasma* with 4.76% divergence.

### *Elachista phantasma* Kaila & Sruoga, sp. nov.

https://zoobank.org/FBC1DAEF-EF1B-4CF2-AE06-424A0A9B502C

Figs 6, 34, 35

**Type material.** ***Holotype.*** KYRGYZSTAN • ♂; Alai Mts., 3220 m, nr. Kashka-Suu village; 39.40573°N, 72.32005°E; 21 Jul. 2010; K. Nupponen & R. Haverinen leg.; L. Kaila prep. 6151, DNA sample 22527 Lepid Phyl.; RCNupp, to be deposited in MZH.

***Paratype.*** KYRGYZSTAN • 2 ♂; Alai Mts., 2820 m, Tengiz-Bai Pass gate; 39.35290°N, 72.15321°E; 24 Jul. 2010; K. Nupponen & R. Haverinen leg.; L. Kaila prep. 6150, DNA sample 22526 Lepid Phyl.; RCNupp; MZH.

**Diagnosis.** *E. phantasma* is a large, narrow-winged species with forewings mottled ochreous grey, lacking distinct markings. In wing pattern, *E. phantasma* is similar to many species treated here, but it can be most easily distinguished by the very small cornutus in the male genitalia.

**Description.** Wingspan 12.5–13.0 mm. Labial palpus as long as diameter of head, off-white, somewhat fuscous below. Head, neck tuft, scape and pedicel of antenna white; tegula and thorax fuscous; flagellum grey. Legs ochreous white. Forewing ground colour consisting of off-white scales that are distally ochreous grey, variably in some areas less, in others more densely, fringe concolorous, sparsely scattered with grey-tipped scales, and forming dark grey fringe line. Hindwing pale grey with concolorous fringe. Underside of wings grey with slight yellowish hue.

***Male genitalia.*** Uncus lobe as long as broad at its broadest point, distally round, with few short setae distolaterally, incision separating uncus lobes 0.7 of length of uncus. Spinose knob of gnathos oval, 1.3–1.6 × as long as broad. Valva 3.5 × as long as broad at its broadest point in the middle; costa strongly convex medially, distinctly emarginated in its distal third; sacculus basally bent, slightly concave beyond middle; cucullus somewhat curved and weakly bent towards costa. Digitate process small, about 1/6 as long as of valva, basally narrow, distally slightly dilated, blunt and setose, ventral margin weakly convex. Juxta lobes widely separated from each other with U-shaped incision, medially produced forming lobe, being 2 × as long as broad; median and lateral margin of median lobe straight, parallel-sided; distal margin with a few short setae; lateral process long and broad; lateral margin concave; median plate with shallow dorsally directed median sac. Vinculum small, with minute saccus. Phallus about 0.7 × as long as valva, straight, 5–6 × as long as broad at its broadest place near base, distally slightly narrowed beyond prominent lateral swelling at distal third and bent beyond second, smaller swelling at apical 1/6; caecum short, round; vesica with one very small, indistinctly delineated spine-like cornutus.

**Female.** Unknown.

**Biology.** Host plant unknown. Adults have been collected in July.

**Distribution.** Kyrgyzstan.

**Etymology.** From the Greek *phantasma*, *-tos* (ghost), refers to the partly indistinct, almost ghost-like cornutus. A noun in apposition.

**DNA barcode information.** Intraspecific divergence distance (n = 2) 0.15% (sample id's: DNA sample 22526 Lepid Phyl; DNA sample 22527 Lepid. Phyl.). Nearest neighbor is *E. multipunctata* with 4.76% divergence.

### *Elachista granicorna* Kaila & Sruoga, sp. nov.

https://zoobank.org/AE32FBA4-766C-4FDA-B637-78930584C344

Figs 7, 36

**Type material.** ***Holotype.*** TAJIKISTAN • ♂; W. Pamir Mts., 3000–3200 m, Devlokh Valley, near Khaburabot Pass; 38.3731°N, 70.4259°E; 17 Jul. 2013; K. Nupponen & R. Haverinen leg.; http://tun.fi NH476, DNA sample FinBOL 2021; Kaila prep. 6153; RCNupp, to be deposited in MZH.

**Diagnosis.** *E. granicorna* is a large and narrow-winged species; its forewings are densely mottled brownish grey without a distinct pattern. In the male genitalia, the truncated cucullus, tapered juxta lobes, and distally granulate vesica separate *E. granicorna* well from the other species treated here.

**Description.** Wingspan 12.0 mm. Labial palpus as long as diameter of head, off-white, fuscous below. Head, and neck tuft off-white, tegula, thorax, scape and pedicel of antenna off-white, intermixed with brownish grey scales; flagellum grey, weakly annulated with slightly paler rings. Foreleg grey with tarsal articles distally white, legs otherwise grey. Forewing unicolorous consisting of off-white scales that are distally grey, fringe concolorous, sparsely scattered with grey-tipped scales, and forming grey fringe line. Hindwing pale grey with concolorous fringe. Underside of wings grey with slight yellowish hue.

***Male genitalia.*** Uncus lobe as long as broad at its broadest point, weakly tapered towards round apex, with a few short setae distolaterally, incision separating uncus lobes 0.6 length of uncus. Spinose knob of gnathos shortly oval, 1.3 × as long as broad. Valva 3.5 × as long as broad at its broadest point in the middle; costa weakly convex medially, shallowly emarginated in its distal fourth; sacculus basally dilated, slightly concave in the middle, joining cucullus at a right angle, distal margin of cucullus straight, not bent towards costa. Digitate process small, about 1/7 length of valva, distally slightly dilated, blunt and setose. Juxta lobes medially produced; median margin somewhat convex; distal margin with a few short setae; lateral process long and narrow; lateral margin concave; median plate with shallow dorsally directed median sac. Vinculum short and broad, V-shaped. Phallus 0.7 × as long as valva, straight, 7 × as long as broad at its broadest place near base, gradually narrowed distally; caecum short; vesica with one elongate cornutus formed as long tooth arising from small irregular sclerotized plate; vesica apically with group of small granules, length of cornutus a little more than 0.1 × length of phallus.

**Female.** Unknown.

**Biology.** Host plant unknown. The only known specimen was captured at mid-July.

**Distribution.** Tajikistan.

**Etymology.** Adopted from the Latin words *granum* (seed, small kernel, pellet) and *cornu*, *-us* (horn). This refers to the somewhat horn-shaped cornutus, surrounded by the apically granulose vesica. It is adjusted to feminine gender to follow that of the generic name *Elachista*. A noun in apposition.

**DNA barcode information.** Intraspecific divergence distance N/A (n = 1) (http://tun.fi NH476, DNA sample FinBOL 2021) Nearest neighbor is *E. atrisquamosa* Staudinger, 1880 with 6.8% divergence.

## *Elachista graeca* Parenti, 2002

Figs 8–10, 37, 48

*Elachista graeca* Parenti, 2002: 150. Type locality: Greece, Itea. Holotype ♂ in MIZT (not examined).

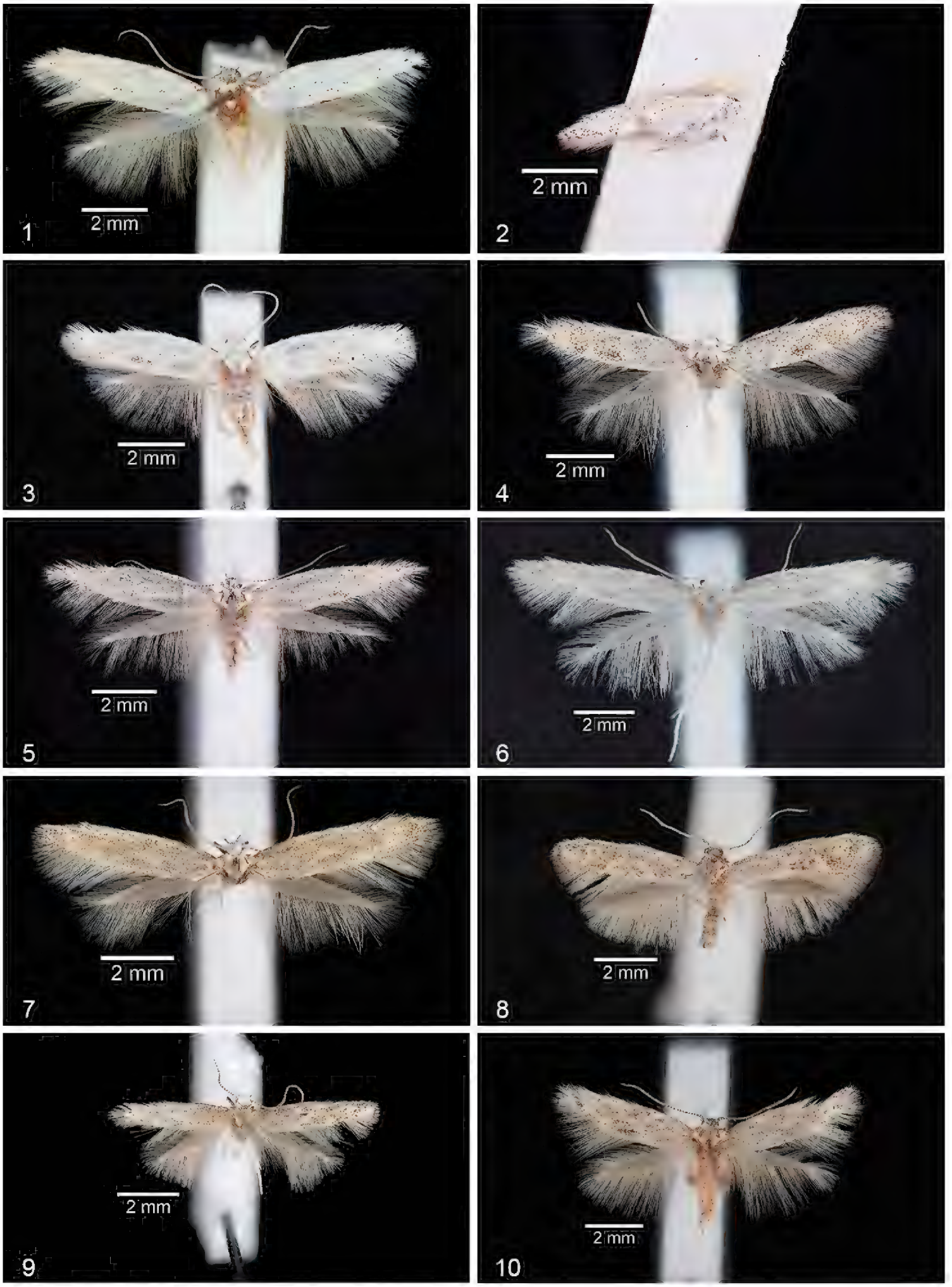
**Material examined.** BULGARIA • 1 ♀; Tuzlata; 41.748°N, 24.767°E; 5 May 2002; J. Junnilainen leg.; RCJJ; • 17 ♂; Kresna; 41.717°N, 23.152°E; 31 May–2 Jun. 2002; J. Junnilainen leg.; L. Kaila prep. 5480; RCJJ, MZH; • 3 ♂; same locality; 31 May–2 Jun. 2002; J.-P. Kaitila leg.; L. Kaila prep. 3395, 3998, 3999, 4431, 4433, DNA sample 16938, 16939 Lepid Phyl.; RCJPK, MZH; • 3 ♂; Kresna Gorge, above the tunnel, 250 m; 41.4741°N, 23.0929°E; 26 May 2012; J.-P. Kaitila & B. Wikström leg.; DNA samples 23240, 23241, 23244 Lepid. Phyl.; RCJPK; • 1 ♂; Struma river valley, Strubyani; 41.755°N, 23.153°E; 7 May 2013; J. Junnilainen leg.; RCJJ; • 1 ♀; 5 km N Kresna, 600 m; 41.717°N, 23.152°E; 26 May 2010; O. Karsholt leg.; DNA sample 22111 Lepid. Phyl.; ZMUC; • 1 ♂; Ilindenci, drinking place upwards; 49.3911°N, 23.1500°E; 15 May 2011; • 1 ♂; same locality; 18 May 2012; J.-P. Kaitila & B. Wikström leg.; DNA sample 23242 Lepid. Phyl.; RCJPK, MZH.

GREECE • 1 ♂; Peloponisos, Arkadia Vitina; 37.66°N, 22.18°E; 24 Jun. 1981; P. Grotenfelt leg.; L. Kaila prep 4569; MZH; • 1 ♂; Aráchova, 10 km E Delfoí, 1000 m; 38.465°N, 22.598°E; 3 Oct. 2000; K. Mikkola leg.; L. Kaila prep. 4538, DNA sample 20949 Lepid. Phyl.; MZH; • 1 ♂; Macedonia, 15 km W Leptokaria, Olympos, 750 m; 40.051°N, 22.434°E; 21–23 May 2001; J. Junnilainen leg.; L. Kaila prep. 4103, DNA sample 16940 Lepid Phyl.; RCJJ; • 3 ♂, 3 ♀; Macedonia, Xerolimni, 15 km W Kozáni; 40.30°N, 21.66°E; 21–23 May 2003; J. Junnilainen leg.; L. Kaila prep. 5481; RCJJ, MZH.

NORTH MACEDONIA • 1 ♀; Ohrid, Galičica, 1400 m; 40.964°N, 20.835°E; 15 Jun. 2015; DNA sample http://tun.fi/NH.526 J. Junnilainen leg.; RCJJ.

**Diagnosis.** *E. graeca* is similar to several other *Elachista* species with the forewing mottled brownish grey with indistinct pattern. The size varies from fairly small to average-sized among *Elachista* spp. Among sympatric, related species *E. rudectella* is similar, but it has often clearer pale markings on the forewing. In the male genitalia the very broad and large cornutus distinguishes *E. graeca* from other species with more or less similar juxta lobes. The elongate uncus lobes with pointed apex are similar with those of *E. nolckeni* and *E. rudectella*. In *E. nolckeni* the uncus lobes are more slender, and in *E. rudectella* basally much wider. The cornutus is much smaller and strongly bent in *E. nolckeni*, and the shape of the juxta lobes is entirely different in *E. rudectella*. The female genitalia are similar to those of *E. lagotara* in the longitudinal folds of broad colliculum. However, the colliculum in *E. graeca* is short and bulbous compared to the long and banana-shaped colliculum in *E. lagotara*.

**Redescription.** Wingspan 7.5–11.5 mm. Labial palpus slightly longer than diameter of head, off-white above, fuscous below. Head and neck tuft off-white, tegula basally grey, distally off-white, thorax and scape of antenna off-white, sometimes intermixed with pale grey scales; flagellum grey dark grey, annulated with paler grey rings. Foreleg dark grey with tarsal articles distally white, legs otherwise off-white, tibia and tarsal articles basally variably dark grey. Forewing with basally pale and distally brownish grey scales giving a mottled appearance, and sometimes irregular pattern such as elongate, indistinct grey patch in the middle, or traces of paler costal and tornal spots near apex of wing. Fringe concolorous with forewing, with dark grey fringe line. Hindwing




**Figures 1–10.** Adults of *Elachista* spp. **1.** *E. afghana* Parenti, ♂, holotype; **2.** *E. multipunctata* Sruoga, ♂, holotype; **3.** *E. multipunctata* Sruoga, ♀ (Tajikistan, Kondara); **4, 5.** *E. multipunctata* Sruoga, ♀ (Tajikistan, Vanch); **6.** *E. phantasma* Kaila & Sruoga, sp. nov. ♂, holotype; **7.** *E. granicorna* Kaila & Sruoga, sp. nov., ♂, holotype; **8.** *E. graeca* Parenti, ♂ (Bulgaria, Ilindenci); **9.** *E. graeca* Parenti, ♂ (Bulgaria, Kresna); **10.** *E. graeca* Parenti, ♀ (Greece, Macedonia).

grey with concolorous fringe. Underside of forewing dark grey with yellow margin, underside and fringe otherwise pale grey.

***Male genitalia.*** Uncus lobe tapered towards pointed apex, 1.5 × as long as broad at its broadest point, with a few short setae distolaterally, incision separating uncus lobes 0.8 length of uncus. Spinose knob of gnathos oval, 1.7 as long as broad. Valva 3.7 × as long as broad at its broadest point in the middle; costa strongly convex medially, distinctly emarginated in its distal third; sacculus basally bent, slightly concave beyond middle; cucullus somewhat curved and weakly bent towards costa. Digitate process small, about 1/7 length of valva, distally slightly dilated, blunt and setose. Juxta lobes widely separated from each other with U-shaped incision, medially produced forming lobes a little longer than wide, base of incision between juxta lobes strongly sclerotized; median and lateral margin straight; distal margin round, with a few short setae; lateral process short and broad; lateral margin concave; median plate with dorsally directed median sac. Vinculum small, with short narrow saccus strongly bent ventrad. Phallus about 0.6 × as long as valva, straight, 4 × as long as broad at its broadest place near base, otherwise almost parallel-sided; caecum short, round; vesica with one large cornutus formed as small tooth arising from large sclerotized plate; length of cornutus 0.4 × of phallus.

***Female genitalia.*** Papilla analis membranous, somewhat tapered towards nearly round apex; ventrally connected with inverted Y-shaped sclerotization. Apophysis posterioris about 1.5 × as long as papilla analis; apophysis anterioris gradually formed from tergum 8, basally wide, approximately 0.5 × as long as apophysis posterioris. Ostium bursae round, dorsal wall sclerotized. Colliculum bulbous, 4/5 as long as apophysis posterioris, with longitudinal folds. Remaining part of ductus bursae 3 × as long as colliculum, membranous, with small internal spines, especially towards corpus bursae. Corpus bursae oval, with small internal spines.

**Biology.** Host plant unknown. The species has been collected at an elevation of 1000 m (the only reported mention). Based on collection data, the species has more than one generation per year.

**Distribution.** Bulgaria, Greece, Croatia (Parenti 2002), North Macedonia (**new record**).

**Remarks.** Association of male and female is confirmed by DNA barcodes. The present authors are unable to unambiguously define which is the actual type locality, as there is more than one locality called Itea in Greece. The most likely site is 38.44°N 22.42°E, Delfoí, Itéa. Some paratypes and other material examined are also from Delfoí region.

**DNA barcode information.** Maximum intraspecific divergence distance 0.31% (n = 8) (DNA samples 16938, 16939, 16940, 20949, 22111, 21242, 23244 Lepid Phyl., DNA sample http://tun.fi/NH.526). Nearest neighbor is *E. atrisquamosa* with 4.91% divergence.

### *Elachista lagotara* Kaila & Sruoga, sp. nov.

https://zoobank.org/4C2D71CB-B428-4D2C-97BA-E950173645A3

Figs 11–14, 38, 39, 49, 57, 58

**Type material.** ***Holotype.*** TURKMENISTAN • ♂; Kopet Dag, 800 m, 40 km E. Garrygala (Kara Kala) (Figs 57, 58); 38.4314°N, 56.6775°E; 26 Jun. 1993; V. Sruoga leg.; L. Kaila prep. 6159 (VU).

***Paratypes.*** TURKMENISTAN • 6 ♂, 22 ♀; same collecting data as in holotype except the dates 5 May–12 Aug. 1993; gen prep. V. Sruoga E24 ♂, E75 ♀, VS153 ♀, VS155 ♂, VS158 ♀, VS199 ♀; • 2 ♂; same locality; 5 Aug. 1993; R. Puplesis & A. Diškus leg.; gen. prep. V. Sruoga VS156 (VU, MZH); • 8 ♂; N. Kopet Dag, 15 km W Firyuza, Mt. Dushak; 37.96°N, 57.90°E; 4–11 Jul. 1990; V. Dubatolov leg.; L. Kaila prep. 1515, 1516, 4429, 4430, 4809, 4813; SZMN, MZH.

**Diagnosis.** *Elachista lagotara* closest resembles *E. latipenella* by its very small size and similar juxta lobes. The juxta lobes are also similar in *E. derbendi* which, however, is a large species and differs from all other species by the curved shape of the cornutus. The male genitalia of *E. lagotara* and *E. latipenella* are readily distinguished from each other by the emarginated costa of the valva, and the narrower distal part of the phallus in *E. lagotara* as compared to *E. latipenella*. The female genitalia are similar with those of *E. graeca* by the longitudinal folds of the broad colliculum and the ductus bursae gradually widening towards the corpus bursae. However, the colliculum in *E. lagotara* is much longer and banana-shaped compared to the short and bulbous colliculum in *E. graeca*.

**Description.** Wingspan 6.0–7.5 mm. Labial palpus slightly longer than diameter of head, off-white above, fuscous below. Head, neck tuft, tegula, thorax and scape of antenna off-white, intermixed with grey-tipped scales; flagellum dark grey, annulated with paler grey rings. Foreleg dark grey with tarsal articles distally white, legs otherwise off-white, tibia and tarsal articles basally variably dark grey. Forewing ground colour off-white, variably peppered with dark-tipped scales giving a mottled appearance and in darker specimens irregular pattern such as traces of paler median fascia and costal and tornal spots near apex of wing. Fringe concolorous with forewing, with dark grey fringe line. Hindwing off-white with concolorous fringe. Underside of forewing pale yellowish grey with yellow margin, fringe pale yellowish grey; underside of hindwing and fringe pale grey.

***Male genitalia.*** Uncus lobe slightly longer than broad at its broadest point, distally round, with few short setae distolaterally, incision separating uncus lobes 0.7 length of uncus. Spinose knob of gnathos oval, nearly twice as long as broad. Valva 3.8–4 × as long as broad at its broadest point in the middle; costa strongly convex medially, distinctly emarginated in its distal third; sacculus basally bent, otherwise straight or slightly concave beyond middle; cucullus somewhat curved and weakly bent towards costa. Digitate process small, about 1/8 length of valva, blunt and setose. Juxta lobes apically tapered, widely separated from each other with V-shaped incision, medially produced; median margin somewhat convex; distal margin with a few short setae; lateral margin concave; median plate with shallow posteriorly directed median sac. Vinculum small, V-shaped. Phallus about 0.7 as long as valva, straight, 5 × as long as broad at its broadest place where it is somewhat swollen at distal 2/3, distally slightly narrowed beyond swelling; caecum short, round; vesica with one slightly bent cornutus formed as short tooth arising from elongate sclerotized plate, cornutus about 0.2 × as long as phallus.

***Female genitalia.*** Papilla analis membranous, round, ventrally connected with inverted Y-shaped sclerotization. Apophysis posterioris about 1.5 × as long as papilla analis; apophysis anterioris short, approximately 1/3 × as long as apophysis posterioris. Ostium bursae wide. Colliculum banana-shaped, strongly sclerotized, as long as apophysis posterioris, with longitudinal folds. Remaining part of ductus bursae broad, membranous gradually joining corpus bursae without border, with small internal spines, especially towards corpus bursae. Corpus bursae elongate, oval, with small internal spines.

**Biology.** Host plant unknown. Adults fly from early May until mid-August. The collecting dates suggest the presence of two generations.

**Distribution.** Turkmenistan.

**Etymology.** An adjective, composed from the Greek words *lagos* (hare) and *otaros* (large-eared). This refers to the large juxta lobes whose shape often resemble ears of a hare. A noun in apposition.

**DNA barcode information.** None available.

## *Elachista latipenella* Sinev & Budashkin, 1991

Figs 15, 16, 40

*Elachista latipenella* Sinev & Budashkin, 1991, in Budashkin and Sinev 1991: 581. Type locality: Ukraine, Crimea, Karadag. Holotype ♂ in ZISP (illustration of habitus and genitalia examined).

**Material examined.** ***Holotype.*** Description and images of the holotype in the original description examined. ***Paratype.*** UKRAINE • 1 ♂; Crimea, Karadag, Biostantsia, 44.9122°N, 35.2008°E; 3 Jul. 1986; Yu. Budashkin leg.; L. Kaila prep. 3396, MZH.

***Other material.*** • 10 ♂; same collecting data as in the type series except date; 10 Jun. 1987; L. Kaila prep. 3399; • 1 ♂; same data except date; 23 Jul. 1990; MZH.

**Diagnosis.** *E. latipenella* is a very small species, similar to *E. lagotara*. Its labial palpus is somewhat shorter than in *E. lagotara*, and the flagellum is unicolorous grey unlike in *E. lagotara*. The forewings are more evenly maculated, with pale ochreous scales, rarely with some darker ones as compared to *E. lagotara*. The male genitalia are also most similar to those of *E. lagotara*, but the nearly straight costa of the valva and the very wide distal part of the phallus in *E. latipenella* readily separate these species.

**Redescription.** Wingspan 6.0–7.0 mm. Length of labial palpus a little less than diameter of head; creamy white above, somewhat fuscous below. Head, neck tuft, tegula, thorax and scape of antenna off-white, intermixed with grey-tipped scales; flagellum grey. Legs off-white. Forewing ground colour off-white, evenly but rather scarcely covered with pale brown scales, in distal half also with darker grey scales. Fringe concolorous with forewing, with indistinct greyish brown fringe line. Hindwing off-white with fringe concolorous, or with yellow hue. Underside of wings pale brownish grey, margins and especially along apex yellow, fringe yellowish grey.

***Male genitalia.*** Uncus lobe slightly longer than broad at its broadest point, distally round, with a few short setae distolaterally, incision separating uncus lobes 0.8 length of uncus. Spinose knob of gnathos oval, 1.7 × as long as broad. Valva 4 × as long as broad at its broadest point in the middle; costa weakly convex medially, shallowly emarginated in its distal third; sacculus basally bent, otherwise straight; cucullus somewhat curved and weakly bent towards costa. Digitate process small, about 1/7 length of valva, distally slightly dilated, blunt and setose. Juxta lobes apically tapered, widely separated from each other with V-shaped incision, medially produced; median margin somewhat convex; distal margin with a few short setae; lateral process short; lateral margin concave; median plate with shallow dorsally directed median sac. Vinculum short and broad, V-shaped. Phallus short, about 0.5 × as long as valva, straight, 3 × as long as broad at its broadest place near apex, strongly dilated in distal part; caecum short; vesica with one straight cornutus formed as long tooth arising from smaller irregular sclerotized plate, length of cornutus about 0.3 length of phallus.

**Female.** Unknown.

**Biology.** Host plant unknown. Adults on the wing were recorded from mid-June until mid-August.

**Distribution.** Ukraine.

**DNA barcode information.** None available.

### *Elachista scolopsa* Kaila & Sruoga, sp. nov.

https://zoobank.org/515AD2E8-2A9C-4149-97F7-1CB29EE33196

Figs 17, 18, 41

**Type material.** ***Holotype.*** LEBANON • ♂; Bcharre, 1825 m, Qurnat Al Sawda; 34.143977°N, 36.035742°E; 9 Jun. 2012; J. Kullberg & T. Lievonen leg.; L. Kaila prep. 6146, DNA sample 16941 Lepid. Phyl.; http://id.luomus.fi/ GK5271; MZH.

***Paratypes.*** • 2 ♂; same collection data as in holotype; DNA sample 23238 Lepid. Phyl.; http://id.luomus.fi/GK5275, GK5276; • 9 ♂; Bcharre, 2230 m, Cornet Al Sawda nr Al-Ariz; 34.1425°N, 36.408°E; 26. Aug. 2010; Jaakko & Anssi Kullberg; L. Kaila prep. 5376, 5377, DNA sample 16942 Lepid. Phyl.; MZH; • 6 ♂; Kesrouan, 1520 m, 2 km W Ain el Qadah; 34.05431°N, 35.78266°E; 29 May 2012; J. Kullberg & T. Lievonen leg.; DNA sample 25349, http://id.luomus.fi/GK5734, GK5761, GK5763, GK5772, GK5795, GK5797; MZH.

**Diagnosis.** *E. scolopsa* is a cream-coloured species, forewings scattered with black-tipped scales that may form irregular stripes or patches. In the male genitalia, it is comparable to *E. afghana* and *E. phantasma* in the shape of the juxta and uncus lobes. However, it can be distinguished by the shape of the phallus, which is dorsally concave in distal third and the apex bent to ventral direction.

**Description.** Wingspan 8.5–10.0 mm. Labial palpus as long as diameter of head, creamy white above, fuscous below. Head, neck tuft, thorax, scape and pedicel of antenna creamy white; flagellum leaden grey, faintly annulated with paler grey rings. Fore- and midleg grey, tarsal articles distally white; hindleg pale ochreous. Forewing ground colour pale creamy, with concolorous fringe, irregularly scattered with black-tipped scales that may form irregular and faint longitudinal, intermittent stripes and black patches, usually near costal margin and apex, as well as irregular black fringe line. Hindwing pale grey, fringe cream-coloured. Underside of forewing dark grey, fringe yellow, underside of hindwing pale grey in costal half, fringe pale grey, variably with yellow bases of scales.

***Male genitalia.*** Uncus lobe 1.2 × as long as broad at its broadest point, distally round and weakly tapered, with few short setae distolaterally, incision separating uncus lobes 0.7 length of uncus. Spinose knob of gnathos oval, 1.5 × as long as broad. Valva 3.6 × as long as broad at its broadest point in the middle; costa strongly convex medially, distinctly emarginated in its distal third; sacculus basally weakly bent, otherwise straight; distal margin of cucullus almost straight, cucullus weakly bent towards costa. Digitate process small, about 1/8 length of valva, distally slightly dilated, blunt and setose. Juxta lobes widely separated from each other with U-shaped incision, medially produced 2 × as long as wide; median margin straight, parallel-sided; distal margin with a few short setae; lateral process long and tapered; lateral margin concave; median plate with shallow dorsally directed median sac. Vinculum small, with short, narrow saccus. Phallus 0.7 × as long as valva, straight, about 5 × as long as broad at its broadest place near base, somewhat concave in distal third, apex bent to ventral direction; caecum round; vesica with one weakly bent cornutus formed as long tooth arising from smaller, elongate, sclerotized plate, length of cornutus about 0.2 × length of phallus.

**Female.** Unknown.

**Biology.** Host plant unknown. The specimens have been collected by UV at elevations ranging from 1500 to over 2000 m. in May and June.

**Distribution.** Only known from montane areas in Lebanon.

**Etymology.** An adjective formed from the Greek *skolos*; *skolops*, *-opos* (anything pointed, thorn), referring to the shape of the cornutus. A noun in apposition.

**DNA barcode information.** Maximum intraspecific divergence distance (n = 4) 0.55% (sample id's: DNA samples 16941, 16942, 25349, 22526 Lepid. Phyl.) Nearest neighbor is *E. atrisquamosa* with 4.71% divergence.

## *Elachista belona* Kaila & Sruoga, sp. nov.

https://zoobank.org/AF3CD547-BFF1-4F0B-A751-9CB1E5DAD2C1

Figs 19–24, 42, 43, 50

**Type material.** ***Holotype.*** RUSSIA • ♂; Tuva Rep., E. Tannu-Ola Mts., 1000 m, Irbitei region, stony steppe slopes; 50.44°N, 93.08°E; 13–16 Jun. 1995; J. Jalava & J. Kullberg leg.; L. Kaila prep. 2198; MZH.

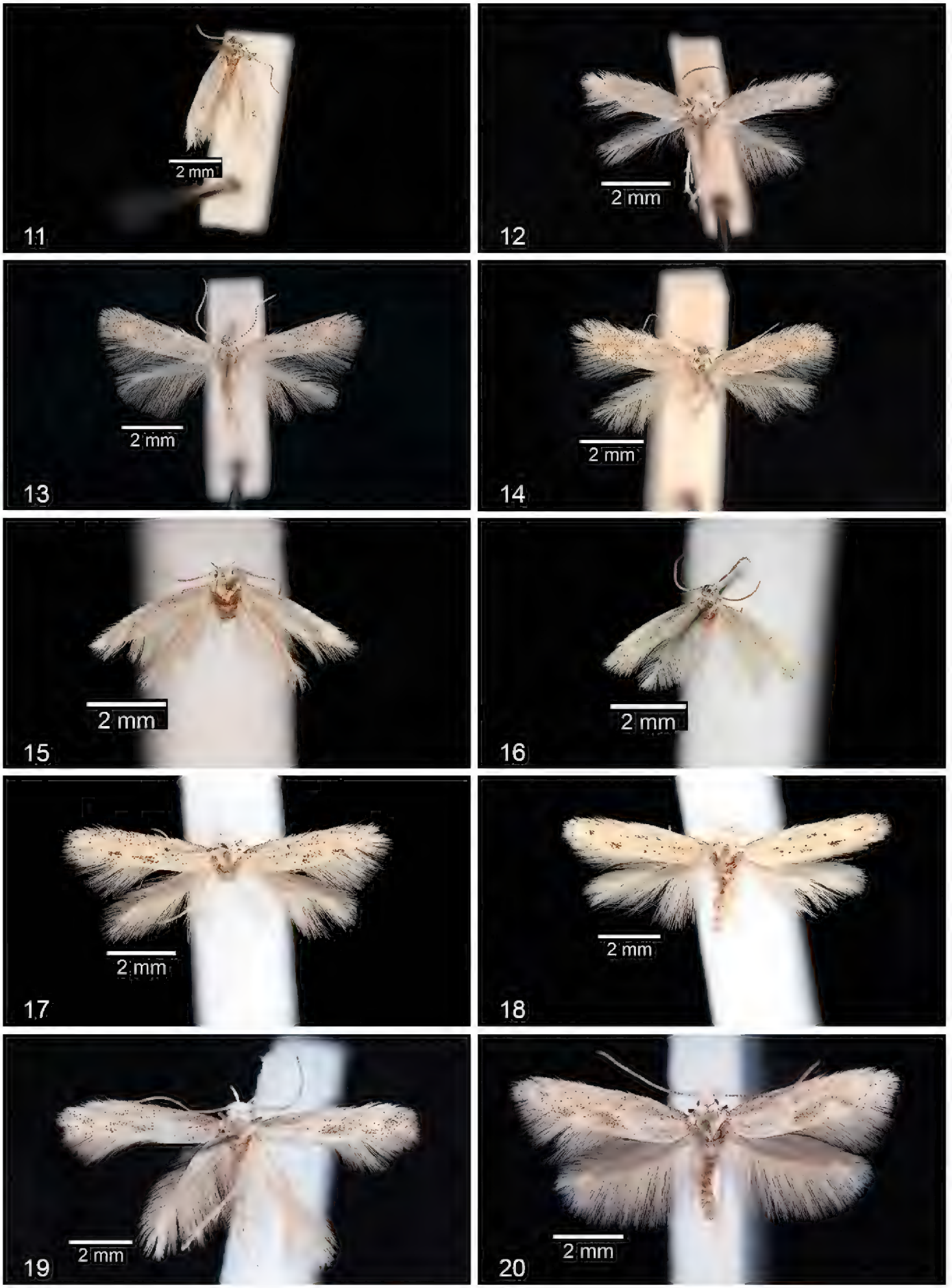
***Paratypes.*** RUSSIA • 1 ♂; same collecting date as in holotype; L. Kaila prep. 1646; MZH; • 4 ♂; Tuva Rep., E. Tannu-Ola Mts., 1250 m, 5 km ENE Khol-Oozha, steppe slopes; 50.45°N, 94.29°E; 16–19 Jun. 1995; L. Kaila prep. 1645, 2195, 2196, 2197, DNA sample 2218 Lepid. Phyl.; MZH; • 2 ♂, 1 ♀; Tuva Rep., Ust-Ujuk, steppe hills; 52.04°N, 92.44°E; 3–5 Jun. 1995; L. Kaila prep. 4419, DNA sample 2217 Lepid. Phyl.; MZH; • 1 ♂, 1 ♀; 40 km N. Irkutsk, steppe slope, ad luc; 52.82°N, 104.41°E; 1–3 Jun. 1984; K. Mikkola & M. Viitasaari leg.; L. Kaila prep. 2203; MZH; • 1 ♂; Buryatia, 35 km SW Ulan-Ude, 700 m, Ivolginsk-Taphar, steppe hill; 51.40°N, 107.20°E; 7 May 1998; J. Kullberg leg.; L. Kaila prep. 3162; MZH; • 2 ♂; Khamar-Daban Mts., 700 m, Murtoy river, 6 km NW Gusinoe ozero village; 51.11–13°N, 106.10–12°E; 19 Jun. 2002; K. Nupponen leg.; L. Kaila prep. 4160, 4162, DNA sample 20848 Lepid. Phyl.; • 3 ♂; the same locality; 27 May–4 Jun. 2006, DNA sample 22220 Lepid. Phyl.; RCNupp, 1 ♂ MZH; • 1 ♂; SW. Buryatia, E. Sayan Mts., 1450 m, 2 km E. Mondy village, forest steppe; 51.67583°N, 101.03473°E; 13 Jun. 2002; K. Nupponen leg., L. Kaila prep. 4157, DNA sample 22219 Lepid. Phyl.; RCNupp.; • 1 ♂; Chikoy valley, 550–600 m, 10 km S Novoselengnisk village, sand dunes/sandy steppe; 50.58–59°N, 106.38–40°E; 29 May 2006; K. Nupponen leg.; RCNupp.; • 1 ♂; Altai, Kosh-Agashk region, Tjurgyny & Ugynskogo Trakta, 1500 m, ad luc; 44.99°N, 88.64°E; 7 Jul. 2001; O. Bidzilya leg.; L. Kaila prep. 4434; ZMKU.

**Diagnosis.** *E. belona* is a large species with the forewing mottled brownish grey and a more or less distinct pale spot at 1/3 and an irregular streak at 2/3 of the wing length. In the male genitalia, the median margin of the juxta is convex at an obtuse angle beyond the middle, and the rather slender phallus resembles that in *E. nolckeni*. However, the uncus lobes in *E. belona* are not tapered to a pointed apex as in *E. nolckeni*, which well separates these two species. The female genitalia of *E. belona* are highly distinctive, with a rounded and somewhat dentate signum, unlike the other species with known females treated here.

**Description. Male.** Wingspan 10.0–12.0 mm. Labial palpus 1.2 × diameter of head, off-white above, fuscous below. Head, neck tuft, thorax, scape and pedicel of antenna off-white, tegula grey; flagellum leaden grey, faintly annulated with paler grey rings. Foreleg dark grey, midleg off-white, tarsal articles grey, distally white; hindleg pale ochreous, spurs and tarsal articles pale grey. Forewing ground colour off-white, variably covered by brownish grey-tipped scales, indistinct pale spot at 1/3 of costa and pale fascia at about 2/3 wing length; these may be nearly invisible; between them often darker grey pattern; fringe concolorous, scattered with grey-tipped scales forming indistinct fringe line. Hindwing grey, fringe cream-coloured. Underside of forewing dark grey, fringe costally cream-coloured, underside of hindwing dark grey in costal third, otherwise grey, fringe pale grey, variably with yellow bases of scales.

**Female.** Otherwise as male, but often ochreous-coloured; annulation of flagellum more distinctive.

***Male genitalia.*** Uncus lobe long and narrow, 1.4 × as long as broad, distally round, with few short setae distolaterally, incision separating uncus lobes 0.7 × as long as uncus. Spinose knob of




**Figures 11–20.** Adults of *Elachista* spp. **11.** *E. lagotara* Kaila & Sruoga, sp. nov., ♂, holotype; **12.** *E. lagotara* Kaila & Sruoga, sp. nov., ♂, paratype; **13, 14.** *E. lagotara* Kaila & Sruoga, sp. nov., ♀, paratypes; **15.** *E. latipenella* Sinev & Budashkin, ♂, paratype; **16.** *E. latipenella* Sinev & Budashkin, ♂, (Ukraine, Crimea); **17.** *E. scolopsa* Kaila & Sruoga, sp. nov., ♂, holotype; **18.** *E. scolopsa* Kaila & Sruoga, sp. nov., ♂, paratype (Lebanon, Bcharre); **19.** *E. belona* Kaila & Sruoga, sp. nov., ♂, holotype; **20.** *E. belona* Kaila & Sruoga, sp. nov., ♂, paratype (Russia, Buryatia).

gnathos oval, nearly twice as long as broad. Valva 3.4–3.7 × as long as broad at its broadest point in the middle; costa strongly convex medially, distinctly emarginated in its distal third; sacculus basally bent, otherwise almost straight, joining cucullus at a right angle, distal margin of cucullus straight, bent towards costa. Digitate process 1/8–1/6 as long as valva, distally dilated, blunt and setose. Juxta lobes widely separated from each other, medially produced; median margin bent at obtuse angle beyond middle; distal margin with a few short setae; lateral process narrow and tapered; lateral margin concave; median plate with shallow posteriorly directed median sac. Vinculum small, often with short, narrow saccus. Phallus narrow, about 0.6 × as long as valva, straight, 6–10 × as long as broad at its broadest place near apex, distally slightly narrowed beyond swelling at distal fourth; caecum somewhat elongate; vesica with one cornutus formed as stout tooth arising from indistinct sclerotized plate, about 0.15 × of the length of phallus.

***Female genitalia.*** Papilla analis membranous, round, ventrally connected with inverted Y-shaped sclerotization. Apophysis posterioris slightly longer than papilla analis; apophysis anterioris almost as long as apophysis posterioris. Ostium bursae narrow, dorsal wall without scobination. Antrum short and narrow, colliculum swollen and oval-shaped, 2/3 as long as apophysis posterioris. Remaining part of ductus bursae narrow, membranous and joining corpus bursae without distinct border. Corpus bursae oval, with small, laterally somewhat dentate signum surrounded by wrinkled area with some internal spines.

**Biology.** Host plant unknown. Adults have been collected at light from early May until early July. The species inhabits different kinds of steppe slopes at elevations ranging between approximately 500–1500 m.

**Distribution.** Russia: S. Siberia, Buryatia, Tuva.

**Etymology.** From the Greek: *belone*, f. (needle, arrowhead, dart; gar). Refers to the arrowhead-shaped cornutus. A noun in apposition.

**DNA barcode information.** Maximum intraspecific divergence distance (n = 5) 1.07% (sample id's: DNA samples 20848, 22217, 22218, 22219, 2220 Lepid. Phyl.). Nearest neighbor is *E. atrisquamosa* with 5.72% divergence.

**Remarks.** Association of male and female is confirmed by DNA barcodes.

### *Elachista derbendi* Parenti, 1981

Figs 25, 44, 51

*Elachista derbendi* Parenti, 1981: 50. Type locality: Iran, Derbend, 25 km N Teheran.

**Material examined.** ***Holotype.*** IRAN • ♂; Derbend, 25 km N Teheran, 2000 m; 28–30 May 1963; Kasy & Vartian leg.; slide 2200 U. Parenti, Mus. Vind. 11.038 (NHMW); female slide 1004 Parenti, Mus. Vind. 11.097, conditionally identified as *E. derbendi* by Parenti.

**Diagnosis.** *E. derbendi* is a large, yellowish-coloured species with a rather distinct wing pattern with two longitudinal strips. In the male genitalia, *E. derbendi* is mostly similar to *E. lagotara*, however, *E. derbendi* clearly differs by the curved shape of the cornutus. The female genitalia of *E. derbendi* can be separated from other species treated here by a combination of two characters: 1) colliculum without longitudinal folds, and 2) ductus bursae gradually widened to the corpus bursae without a distinct border.

**Redescription.** Wingspan 12.0 mm. Labial palpus 1.2 × diameter of head; labial palpus, head, neck tuft, tegula, thorax, scape and pedicel cream-coloured. Flagellum grey. Foreleg grey above with yellow rings in tarsal articles, legs otherwise pale yellow with faintly darker distal part of tibia and tarsal articles. Forewing ground colour pale yellow, basal 1/3 of costa narrowly grey, from middle to apex with grey scales forming two elongate, indistinctly delineated longitudinal stripes; fringe concolorous, scattered with grey-tipped scales forming indistinct fringe line. Hindwing pale grey, fringe cream-coloured. Underside of forewing yellowish grey with paler fringe, underside of hindwing pale grey with concolorous fringe.

***Male genitalia.*** Uncus lobe 2 × as long as broad, distally round, incision separating uncus lobes 0.3 × length of uncus. Spinose knob of gnathos oval, nearly twice as long as broad. Valva 3.8 × as long as broad at its broadest point in the middle; costa convex medially, distinctly emarginated in its distal third; sacculus basally slightly bent, otherwise almost straight, joining cucullus without angle, distal margin of cucullus straight, distally round and joining distal margin without distinct limit. Length of digitate process 1/7 of valva, blunt, distally dilated and setose. Juxta lobes narrowly separated from each other, medially produced; median margin bent laterad; lateral margin distally straight, basally strongly concave; median plate with shallow dorsally directed median sac. Vinculum broad, V-shaped. Phallus parallel-sided, 0.7 × as long as valva, straight, about 5.5 × as long as broad; caecum somewhat elongate; vesica with cornutus formed as stout and curved tooth, length of cornutus about 0.1 length of phallus.

***Female genitalia*** (with reservation of conspecificity). Papilla analis membranous, round, ventrally connected with inverted Y-shaped sclerotization. Apophysis posterioris 2 × as long as apophysis analis; apophysis anterioris almost as long as papilla analis. Ostium bursae narrow, dorsal wall without scobination. Colliculum swollen, asymmetric, 2/3 as long as apophysis posterioris. Remaining part of ductus bursae membranous, gradually widened, joining corpus bursae without distinct border. Corpus bursae oval, without signum, with prominent internal spines.

**Biology.** Host plant unknown. Adults on the wing were recorded from mid-April until late June (Parenti 1981).

**Distribution.** Iran.

**DNA barcode information.** None available.

**Remarks.** The association of the male and female is not certain. Parenti (1981) did not include any female to the type series. However, the female characteristics of the slide available to us, with question mark identified as *E. derbendi* by Parenti, match well those of related species treated here.

### *Elachista rudectella* Stainton, 1851

Figs 26–28, 45, 52, 53

*Elachista rudectella* Stainton, 1851: 26. Type locality: Austria, probably Wien. Lectotype in NHMUK, designated by Traugott-Olsen and Nielsen (1977: 112); examined.
*Poeciloptilia rudectella*: Herrich-Schäffer (1855: 302, 311).

**Material examined.** AUSTRIA • 1 ♂, 1 ♀; Spitzerberg, 260 m; 48.09°N, 16.95°E; 30 Jun. 2007; P. Buchner leg.; L. Kaila prep 5456, DNA sample 20835 Lepid. Phyl.; L. Kaila prep. 6149; TLMF; • 3 ♂; Austria, Hundsheim, Spitzerberg; 18 Jul. 2011; J. Tabell leg.; Tabell prep. 4734; DNA sample 20227, 20230 Lepid. Phyl.; MZH; • 1 ♀; Trockenrasen; 48.05°N, 16.56°E; 30 Jun. 2007; P. Buchner leg.; L. Kaila 6148, DNA sample 21358 Lepid. Phyl.; MZH.

BULGARIA • 1 ♂; Sansansko Pole, Drag Dallas; 41.59°N, 21.25°E; 22 Apr. 2014; J.-P. Kaitila leg.; RCJPK.

GREECE • 1 ♂; Macedonia, 15 km W. Kozáni, Metamorfosi; 40.30°N, 21.66°E; 22 May 2003; J.-P. Kaitila leg.; L. Kaila prep. 4313; RCJPK.

HUNGARY • 1 ♂; Nyir P. Kecskemét; 49.60°N, 19.69°E; 17–27 May 1939; J. Klimesch leg.; ZSM.

ITALY • 1 ♂; Prov. Abrozzo, Castèl di Ieri, 550 m; 42.117°N, 13.742°E; 9–11 Jun. 2005; P. Skou leg.; L. Kaila prep. 4749; ZMUC; • 1 ♂; Prov. Udine, Interneppo; 46.325°N, 13.028°E; 10–27 May 1968; J. Klimesch leg.; ZSM.

KAZAKHSTAN • 3 ♂, 1 ♀; Akm., Kokch., Shchuchie Barmashi, 19 Jun. 1928; Filipjev leg.; ZISP.

KYRGYZSTAN • 9 ♂; Tian-Shan Mts., 2500 m, Eki-Naryn; 41.43764°N, 75.99539°E; 4 Aug. 2010; K. Nupponen & R. Haverinen leg.; DNA samples 22542, 22544, 22545, 22547, 22566, L. Kaila prep. 5829; RCNupp.; • 1 ♂; 30 km E Naryn, 2500 m; 41.25°N, 76.20°E; 29 Jul. 1990; L. Kaila & K. Mikkola leg.; L. Kaila prep. 494; MZH; • 1 ♂; 40 km E Naryn, 2750 m; 41.21°N, 71.29°E; 2 Aug. 1990; K. Mikkola leg.; L. Kaila prep.495; MZH; • 1 ♀; Naryn, 2600 m; 41.42°N, 75.90°E; 5 Aug. 1981; S. Sinev leg.; ZISP.

RUSSIA • 2 ♂; S. Ural, Cheliabinsk oblast, 350 m, Arkaim reserve near Amurskii village, Arkaim; 52.39°N, 59.34°E; 9 Jul. 1997; K. Nupponen & J. Junnilainen leg.; L. Kaila prep. 3329, 5332; MZH, RCNupp.; • 1 ♂; Orenburg oblast, 350 m, 20 km S Mednogorsk, near Kidriasovo village; 51.13°N, 57.37°E; 16 Jun. 1999; T. & K. Nupponen leg.; RCNupp.; • 2 ♂; Cheliabinsk oblast, 650 m, near Moskovo village; 53.57°N, 59.03°E; 22 May 1996; K. Nupponen, J.-P. Kaitila, J. Junnilainen & M. Ahola leg.; 7 ♂; same locality; 10 Jul. 1997; K. Nupponen & J. Junnilainen leg.; 1 ♂; same locality; J.-P. Kaitila leg.; MZH, RCJJ, RCJPK, RCNupp.; • 3 ♂; Cheliabinsk oblast, 250 m, Troizkii reserve near Berlin village; 53.59°N, 61.12°E; 30 Jun.–2 Jul. 1997; K. Nupponen & J. Junnilainen leg.; RCJJ, RCNupp.; • 1 ♂; Bashkiria, 450 m, Sakmara river near Janty-shevo village, 51.54°N, 57.43°E; 21 Jun. 1996; K. Nupponen, J.-P. Kaitila, J. Junnilainen & M. Ahola leg.; RCNupp.; • 1 ♂; Orenburg oblast, 170–230 m, Pokrovka village 20 km S, Schibendy valley; 50.40–45°N, 54.26–28°E; 3–7 Jun. 1998; J. Junnilainen leg.; RCJJ; • 4 ♂; Orenburg distr. Orenburgskij Nat. Pk., Burtinskiy steppe; 51.84°N, 55.18°E; 12–17 Jun. 2001; J. Kullberg & M. Zalewski leg.; L. Kaila prep. 3561, 3564; MZH; • 1 ♂; Altai Mts., Kuraiskaya step, 1500–1700 m; 50.14–16°N, 87.50–55°E; 25 Jun. 2000; T. & K. Nupponen leg.; L. Kaila prep. 4152; RCNupp.; • 1 ♂; Tuva rep., 20 km S. Mugur-Aksyi, 2150 m; 50.21°N, 90.44°E; 1–3 Jul. 2001; P. Ustjuzhanin leg.; L. Kaila prep. 4435; ZMKU; • 11 ♂; Altai Mts., Katun valley, 10 km W Katanda, 1200 m; 50.176°N, 86.041°E; 15–27 Jul. 1983; exp. Mikkola, Hippa & Jalava leg.; L. Kaila prep. 364, 365, 369, 6155; MZH.

SWITZERLAND • 1 ♂; Wallis, Zeneggen, 1200 m; 45.272°N, 7.867°E; 1 Jun. 1987; K. Mikkola leg.; MZH.

**Diagnosis.** Externally *E. rudectella* is similar to several other *Elachista* species as having more or less white forewing with indistinct darker pattern formed of grey brownish and grey-tipped scales. *E. rudectella* is readily distinguished from all other *Elachista* species by the shape of the juxta lobes that are elongate and distally characteristically conical. The shape of the juxta lobes somewhat resembles those in species of the *E. bedellella* species complex (cf. Kaila 2007) in which the apex of juxta lobes is, however, entirely sickle-shaped. The juxta lobes in these species are sickle-shaped, not distally conical. In addition, the phallus of *E. rudectella* contains distally a spine that no other species in the *E. bedellella* group possesses.

**Redescription.** Wingspan 7.5–11.0 mm. Labial palpus as long as diameter of head, white above, variably fuscous below. Head, neck tuft, tegula, thorax, scape and pedicel of antenna white; flagellum grey. Fore- and midleg grey, tibia and tarsal articles distally white; hindleg off-white, tarsal articles basally pale grey. Forewing ground colour white, irregularly scattered with ochreous, brown and nearly black scales forming a restlessly pale brownish-grey general appearance especially in distal half; base of costal narrowly black; fringe off-white with scattered dark tipped scales which also form dark grey fringe line. Hindwing grey, fringe yellowish grey. Underside of forewing grey, fringe yellow, underside of hindwing grey, with concolorous fringe.

***Male genitalia.*** Uncus lobe basally convex, strongly tapered beyond middle towards pointed apex, 1.4 × as long as broad at its broadest point, with a few short setae near apex, incision

separating uncus lobes 0.8 length of uncus. Spinose knob of gnathos narrow and elongate, 2.4 × as long as broad. Valva 3.5 × as long as broad at its broadest point in the middle; costa strongly convex medially, distinctly emarginated in its distal third; sacculus basally bent, slightly concave beyond middle; cucullus somewhat curved and strongly bent towards costa. Digitate process small, about 1/6 length of valva, distally dilated, blunt and setose. Juxta lobes very long, widely separated from each other with U-shaped incision, medially produced, base of incision between juxta lobes strongly sclerotized; median margin strongly convex apically; distal margin acute, with a few short setae; lateral process short; lateral margin concave; median plate with shallow posteriorly directed median sac. Vinculum short and broad, V-shaped. Phallus broad, about 0.7 × as long as valva, straight, 5 × as long as broad at its broadest place near base, otherwise almost parallel-sided, with strong lateral tooth at apical 1/6; caecum short, round; vesica with one large cornutus formed as long tooth arising from large bent sclerotized plate, cornutus 0.3 × length of phallus.

***Female genitalia.*** Papilla analis membranous with nearly round apex; ventrally fused with inverted Y-shaped connecting sclerotization. Apophysis posterioris about 2 × as long as papilla analis. Apophysis anterioris approximately 0.4–0.6 × as long as apophysis posterioris. Ostium bursae broad, dorsal wall sclerotized. Colliculum long and broad, width almost 1/3 its length, with longitudinal folds. Remaining part of ductus bursae about 2.5 × as long as colliculum, gradually widening towards corpus bursae, with long band of coarse spines from apical 1/4 until corpus bursae. Corpus bursae oval, broadly covered with small internal spines and two large patches of strong spines.

**Biology.** *E. rudectella* inhabits dry, exposed calcareous hillsides, with a wide elevational range of between about 200–2600 m. It is attracted to black light, but male can be found active already at dusk. *Phleum phleoides* (L.) H.Karst. (Poaceae) has been reported as a host plant (Hoffmann 1893).

**Distribution.** Austria, Bulgaria (**new record**), Czech Republic, France, Germany, Greece, Hungary, Italy, Kyrgyzstan, Russia (S. Ural, Siberia, Tuva) (Kaila 2019), Serbia (Dobrosavljevic et al. 2017), Slovakia, Switzerland, Ukraine (Kaila 2019).

**DNA barcode information.** Maximum intraspecific divergence distance (n = 16) 2.39% (sample id's: BL_LSNOE_Lep_ 03224, 03260, 03625, 03266, 03508, 03759, 03767, 03772, 04179; DNA samples 20835, 20227, 20230, 21358 Lep. Phyl.; KLM Lep 17515; TLMF 15469, 25740, 25810, 32994, 33059, 37759). Nearest neighbour is *E. maculata* Parenti, 1978 with 5.58% divergence.

## *Elachista nolckeni* Šulcs, 1992

Figs 29, 30, 46, 54

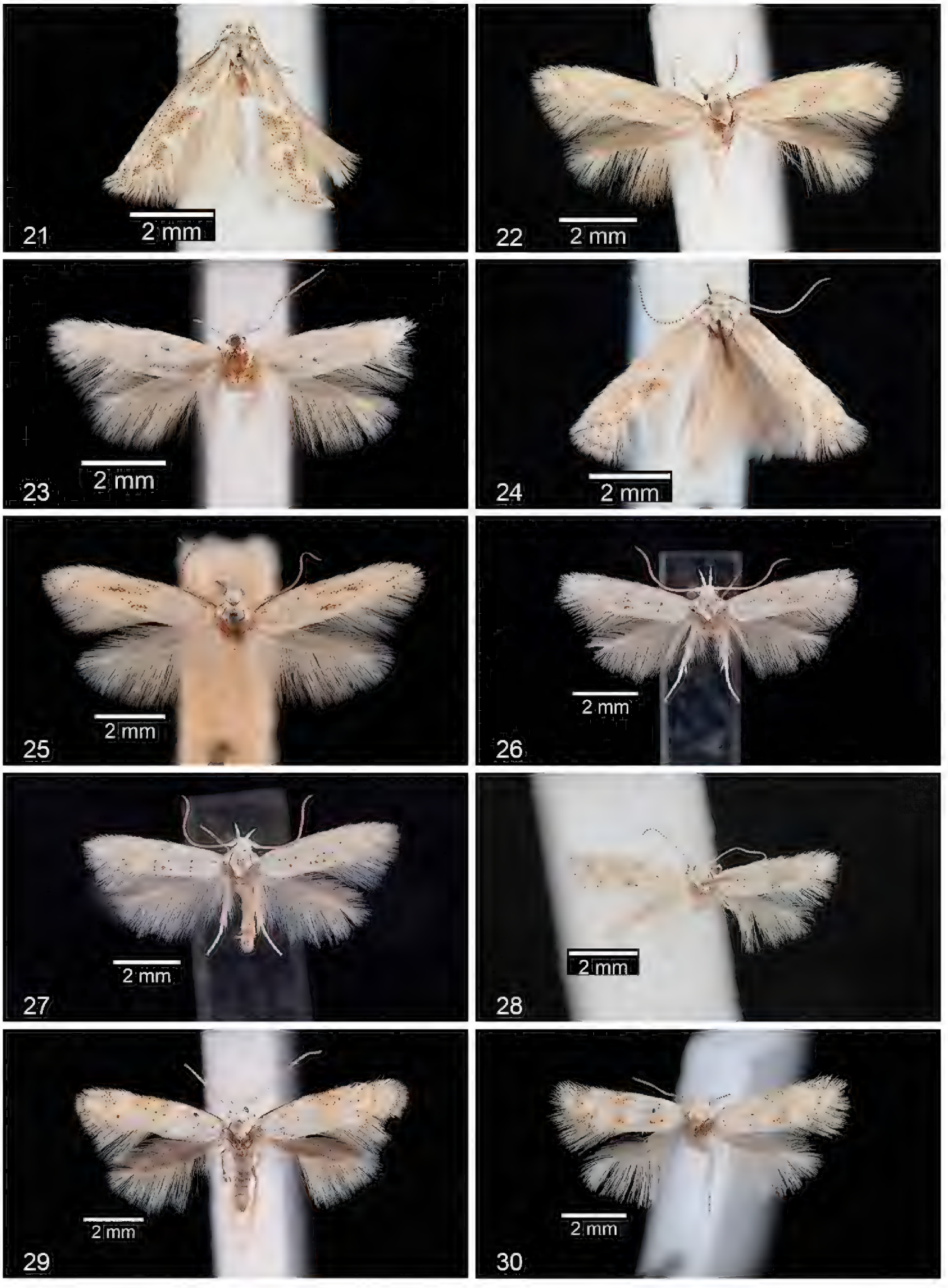
*Elachista nolckeni* Šulcs, 1992: 105. Type locality: Latvia, Riteri. Holotype ♂, depository not stated (not examined).

**Material examined.** AUSTRIA • 4 ♂; Austria inf., Dürnstein; 48.397°N, 15.528°E; 6 Jun. 1938; J. Klimesch leg.; ZSM.

ESTONIA • 3 ♂; Saaremaa, Kogula; 58.259°N, 22.307°E; 16 Jun. 1992; J. Junnilainen leg.; L. Kaila prep. 645, MZH, RCJJ; 6 ♂; same locality; 4–6 Jul. 1994; J. Junnilainen & K. Nupponen leg; MZH, RCJJ, RCNupp; 1 ♀; Saaremaa, Kübassaare, 58.447°N 23.3064°E; ex larva, host *Phleum phleoides*, 2008; J. Junnilainen leg.; L. Kaila prep. 6382; RCJJ.

GEORGIA • 5 ♂; Great Caucasus Mts., 1870 m, by Juta Village; 42.33°N, 44.42°E; 18 Jul. 2015; K. Nupponen & R. Haverinen leg.; DNA sample 25479 Lepid. Phyl., DNA voucher FinBOL 2021 http://tun.fi/NH.466; DNA voucher FinBOL 2021 http://tun.fi/NH.467; MZH, RCNupp.

ITALY • 1 ♂; Bolzano, above Laatsch, steep open slope, 1180 m, uvl; 46.4043°N,10.3138°E; 10 Jul. 2004; B. Landry & P. Schmitz leg.; MHN; • 1 ♂; Bolzano, Tubre, 1500 m, Castello di Sopra, afternoon; 46.3921°N, 10.2746°E; 29 Jun. 2003; Landry, Schmitz, Agassiz leg.; L. Kaila prep. 4832; MHN.




**Figures 21–30.** Adults of *Elachista* spp. **21.** *E. belona* Kaila & Sruoga, sp. nov., ♂, paratype (Russia, Tuva); **22.** *E. belona* Kaila & Sruoga, sp. nov., ♂, paratype (Russia, Buryatia); **23.** *E. belona* Kaila & Sruoga, sp. nov., ♀, paratype (Russia, Buryatia); **24.** *E. belona* Kaila & Sruoga, sp. nov., ♀, paratype (Russia, Tuva); **25.** *E. derbendi* Parenti, ♂, holotype; **26, 27.** *E. rudectella* Stainton, ♂ (Austria); **28.** *E. rudectella* Stainton, ♀ (Austria); **29.** *E. nolckeni* Šulcs, ♂ (Estonia); **30.** *E. nolckeni* Šulcs, ♀ (Estonia).

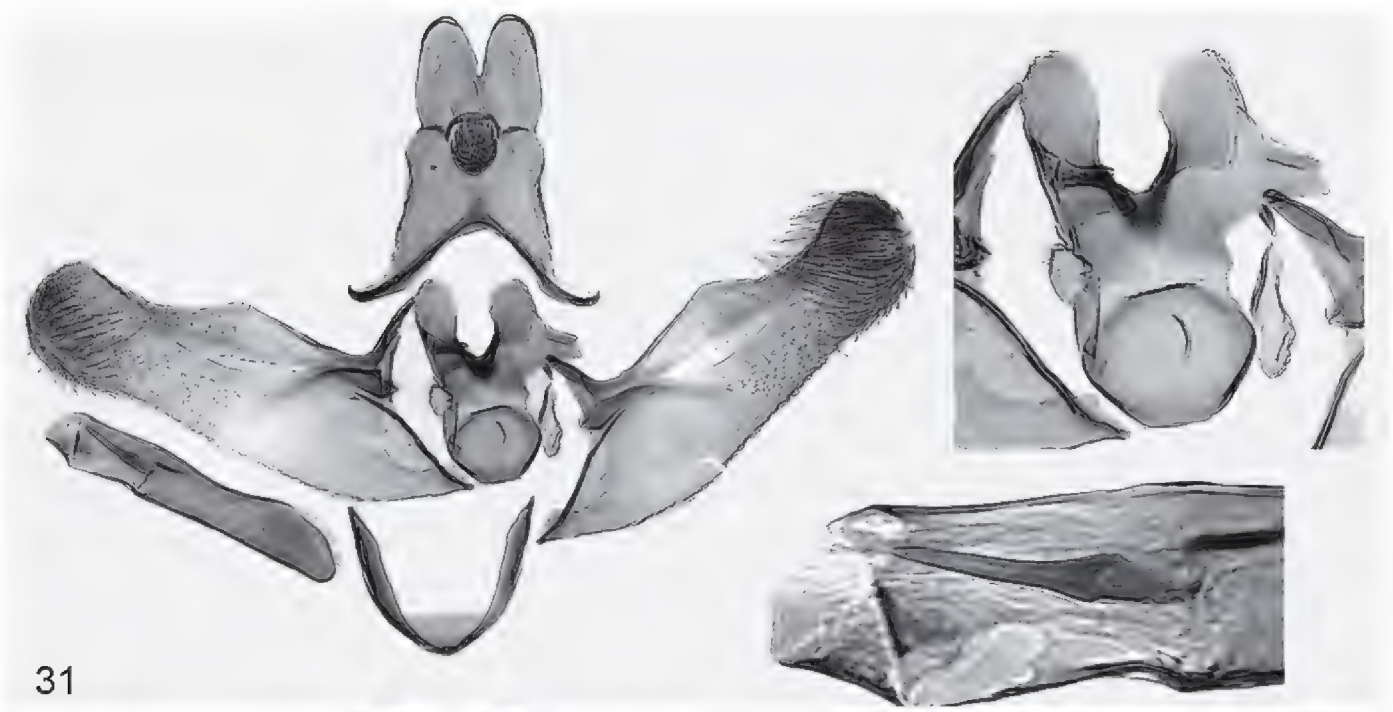
RUSSIA • 4 ♂ 1 ♀; S. Ural, Cheliabinsk oblast, Miass, Ilmen State reserve, 350 m; 55.01°N, 460.06°E; 26–30 Jun. 1997; J.-P. Kaitila & K. Nupponen leg.; L. Kaila prep. 3313; MZH, RCJJ, RCNupp; 1 ♂; the same locality; 10 Jul 1997; J.-P. Kaitila leg.; RCJPK; 1 ♂; the same locality; 24 Jun. 2001; K. Nupponen leg.; RCNupp. • 1 ♂; Cheliabinsk oblast, near Moskovo village, 650 m; 53.57°N, 59.03°E; 10 Jul. 1997; J.-P. Kaitila leg.; RCJPK; • 3 ♂; Caucasus, Kabarnino-Balkariya Nature Reserve, 2200 m; 18–19 Jul. 1989; Zagulayev leg.; Gen prep. V. Sruoga VS363, VS364, VS365; ZISP.

SPAIN • 1 ♂; Hispania sept., Coll del Canto (Sort) 1650 m; 42.41°N, 1.13°E; 5 Jul. 1992; A. Laštůvka leg.; slide A23.1292 (ETO), [*Elachista occulta* det. E. Traugott-Olsen]; ZMUC.

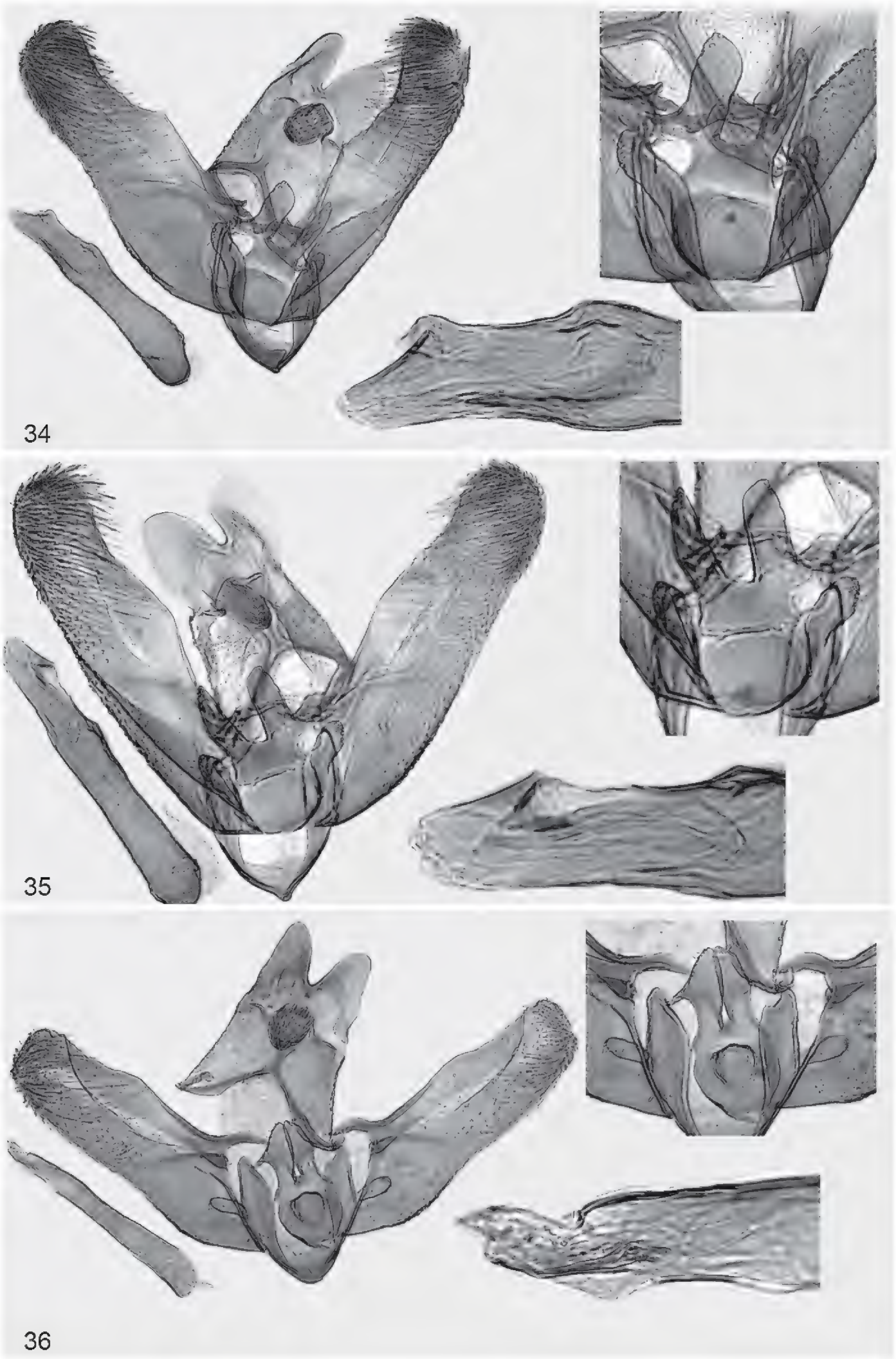
**Diagnosis.** *E. nolckeni* is a silky white species with yellow bands in the middle and near apex of the forewing. The wing is variably scattered with raised, black scales. As such, it is more reminiscent of species such as *E. pollinariella* Zeller, 1839, *E. heringi* Rebel, 1899 and *E. szocsi* Parenti, 1978 in the *E. argentella* group rather than species of the *E. bedellella* group dealt with here. The male genitalia of *E. nolckeni* have elongate, pointed uncus lobes, resembling those of *E. graeca* and *E. rudectella*. *E. nolckeni* is readily distinguished from these species by its much smaller and curved cornutus. The male genitalia of *Elachista ohridella* and *E. laurikailai* closely resemble *E. nolckeni*. There is, however, not a cornutus in the vesica in these species. The forewing of *E. ohridella* is unicolorous cream coloured. Its genitalia are similar to those of *E. nolckeni*. *E. laurikailai* also differs from *E. nolckeni* by the shape of the juxta lobes which are significantly shorter in this species. The female of *E. laurikailai* was conditionally described by Varenne and Nel (2020) but unfortunately the genitalia dissection shown was rather unsuccessful and nearly no details can be seen from it. The illustration of female genitalia of *E. ohridella* provided by Parenti (2001) is likely a misidentification, depicting a species in the *E. argentella* group. Female is a little smaller than male.

**Redescription.** Wingspan 8.0–10.0 mm. Labial palpus as long as diameter of head, yellowish white above, variably fuscous below. Head, neck tuft, tegula, thorax, scape and pedicel of antenna white, often with slight yellowish tinge; flagellum grey. Fore- and midleg grey, tibia and tarsal articles distally white; hindleg off-white, tarsal articles basally pale grey. Forewing ground colour silky white, with irregular yellow band in the middle and near apex, scattered with brown and black, raised scales; basal 1/3 of costa narrowly black; fringe concolorous, scattered with brown-tipped scales forming indistinct fringe line. Hindwing grey, fringe concolorous. Underside of forewing grey, fringe scales yellow, underside of hindwing grey, with concolorous fringe.

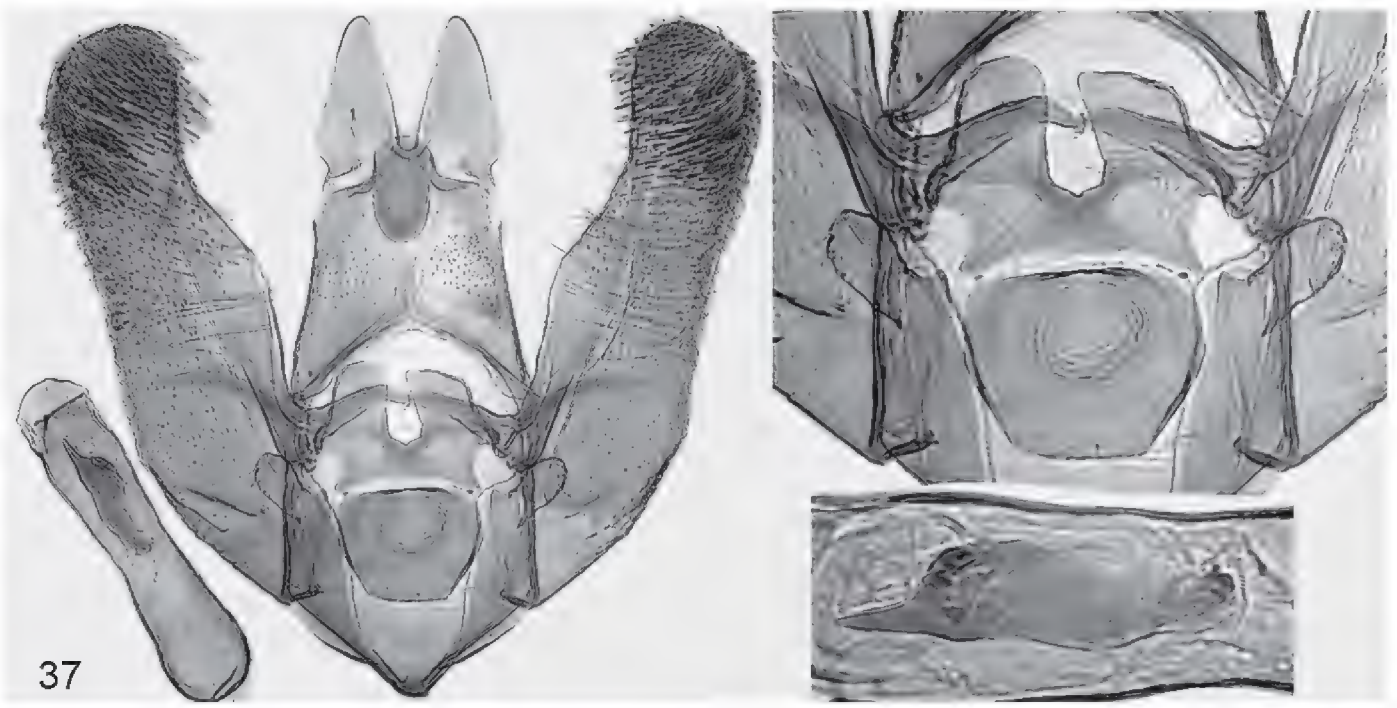
***Male genitalia.*** Uncus lobe tapered towards pointed apex, 2 × as long as broad at its broadest point, with few short setae distolaterally, mesial margin weakly concave beyond middle, incision separating uncus lobes deep, 0.9 × as long as uncus. Spinose knob of gnathos oval, twice as long as broad. Valva 4 × as long as broad at its broadest point in the middle; costa convex medially, shallowly emarginated in its distal third; sacculus basally bent, otherwise straight; distal margin of cucullus almost straight, cucullus weakly bent towards costa. Digitate process small, about 1/7 as long as valva, distally slightly dilated, blunt and setose. Juxta lobes widely separated from each other with U-shaped incision, medially produced; median margin bent at obtuse angle beyond middle; distal margin with a few short setae; lateral process long and tapered; lateral margin concave; median plate with shallow posteriorly directed median sac. Vinculum short and broad, V-shaped. Phallus about 0.6–0.7 × as long as valva, straight, 6–8 × as long as broad at its broadest place near base, distally slightly narrowed beyond prominent lateral swelling at distal third; caecum short, round; vesica with one cornutus formed as short tooth arising from elongate, bent sclerotized plate, length of cornutus about 0.1 × phallus.

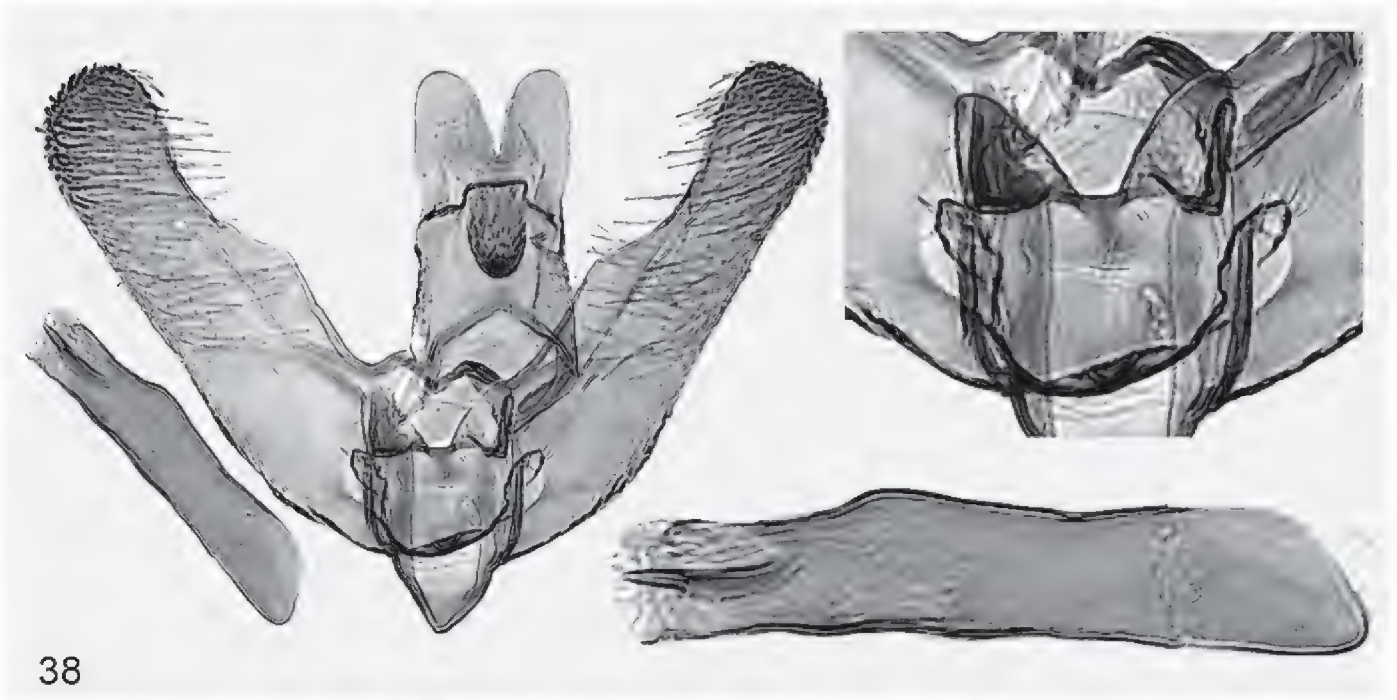


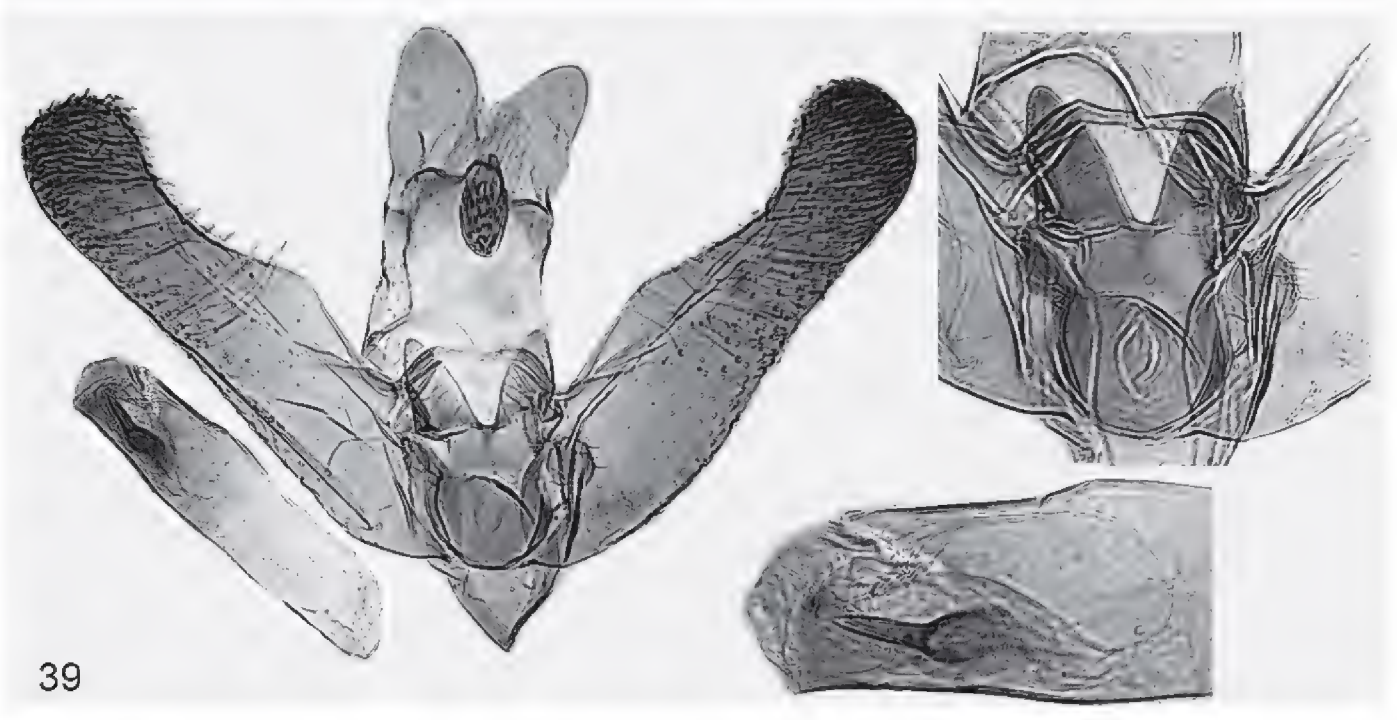

**Figures 31–33.** Male genitalia of *Elachista* spp. Left: general image of genitalia, phallus in same scale. Right top: juxta and digitate process. Right bottom: cornutus as enlarged. **31.** *E. afghana* Parenti, holotype, U. Parenti prep. 1047; **32.** *E. multipunctata* Sruoga, holotype, L. Kaila prep. 6160; **33.** *E. multipunctata* Sruoga, L. Kaila prep. 6152.



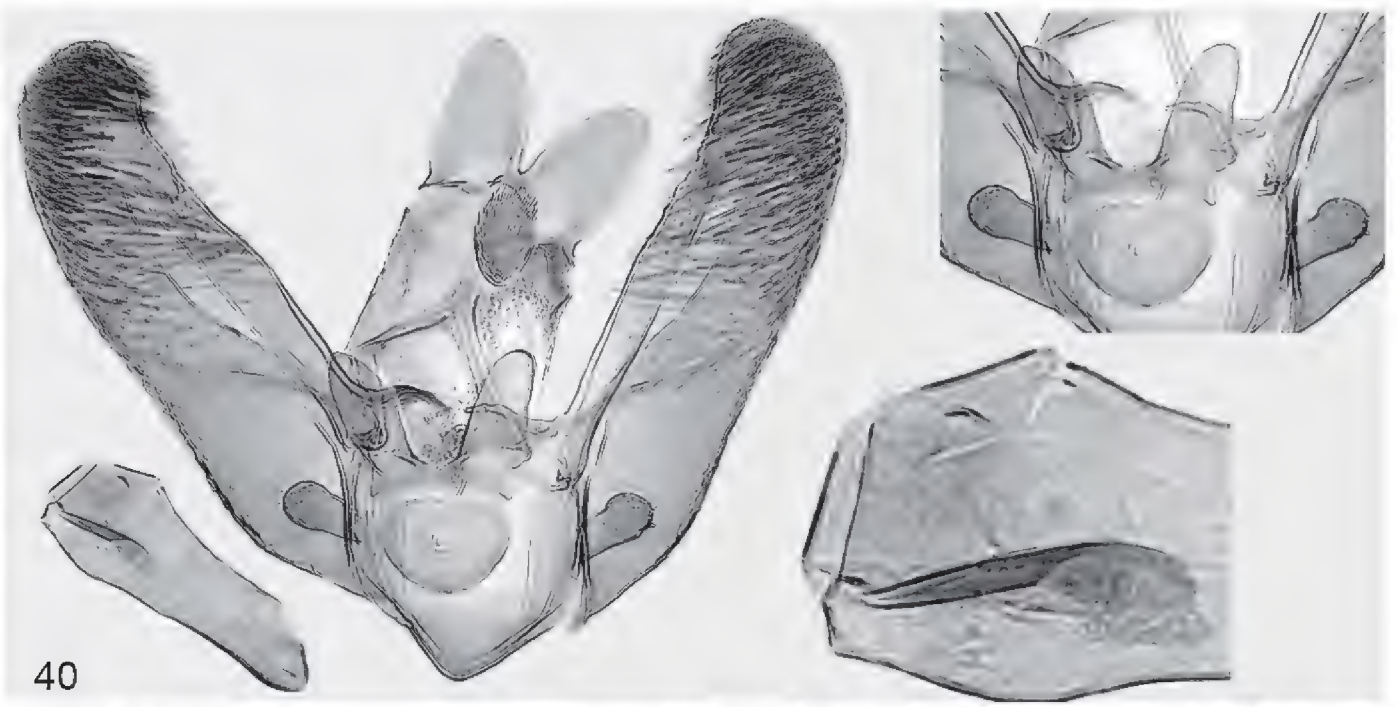

**Figures 34–36.** Male genitalia of *Elachista* spp. Left: general image of genitalia, phallus in same scale. Right top: juxta and digitate process. Right bottom: cornutus as enlarged. **34.** *E. phantasma* Kaila & Sruoga, sp. nov., holotype, L. Kaila prep. 6151; **35.** *E. phantasma* Kaila & Sruoga, sp. nov., paratype, L. Kaila prep. 6150; **36.** *E. granicorna* Kaila & Sruoga, sp. nov., holotype, L. Kaila prep. 6153.

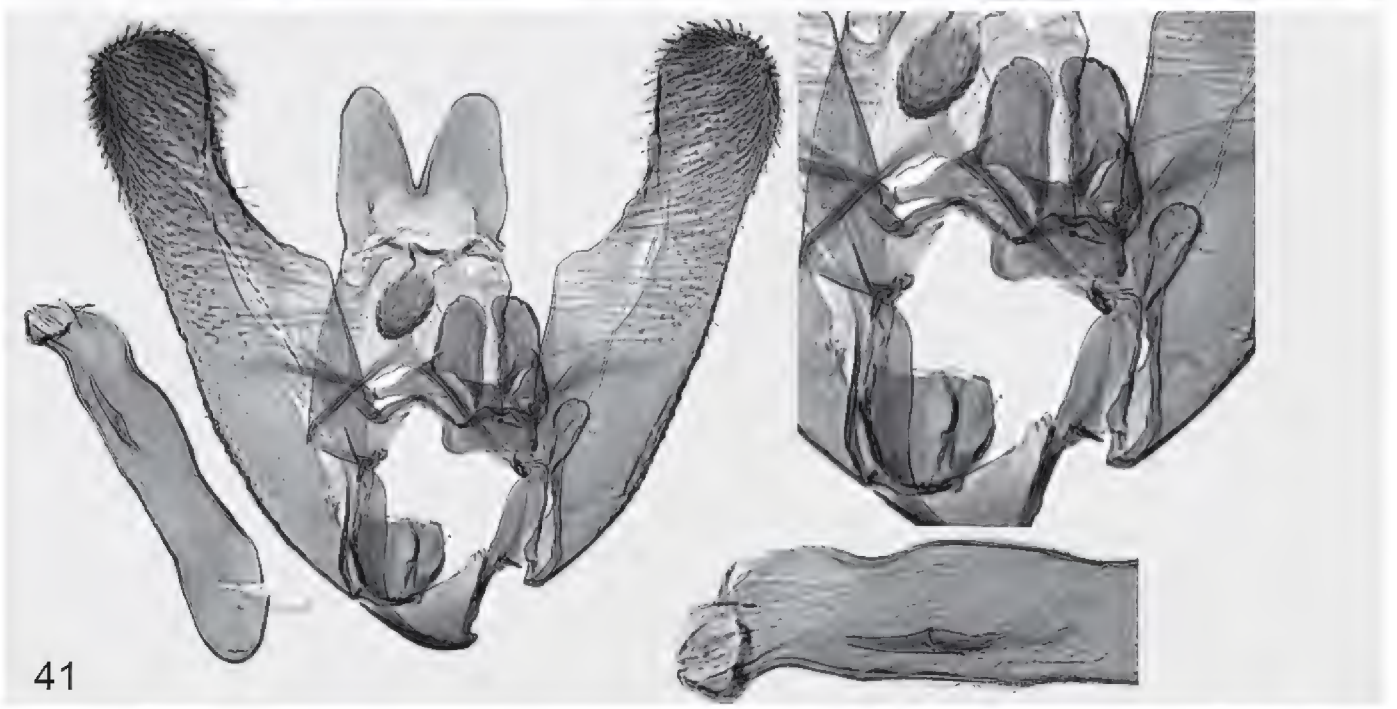


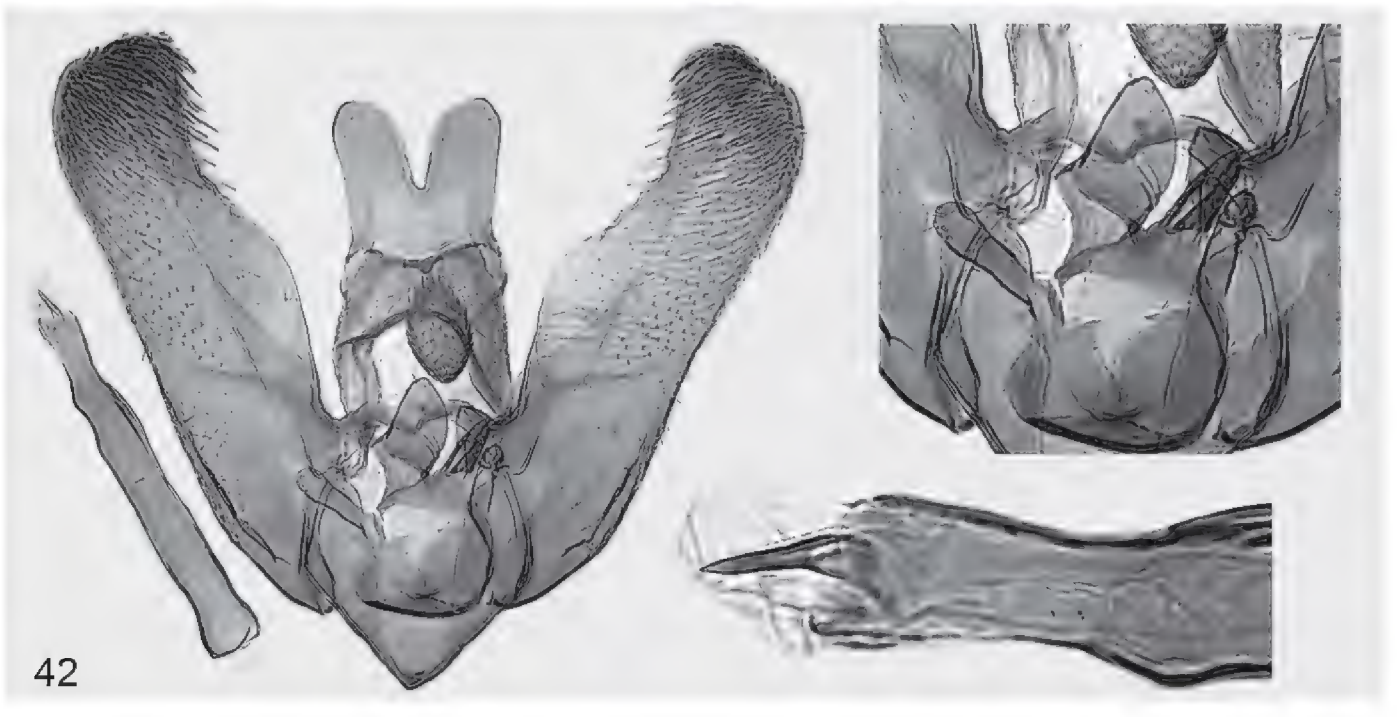



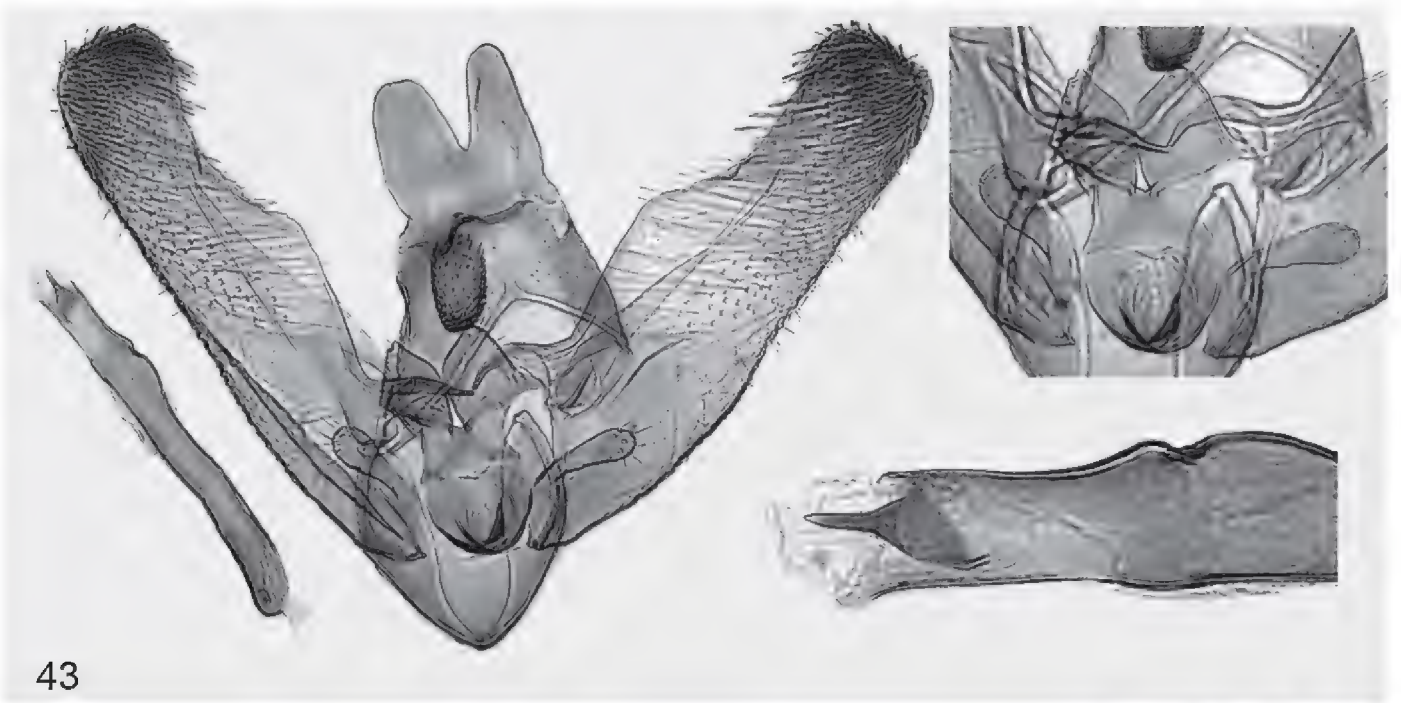

**Figures 37–39.** Male genitalia of *Elachista* spp. Left: general image of genitalia, phallus in same scale. Right top: juxta and digitate process. Right bottom: cornutus as enlarged. **37.** *E. graeca* Parenti, L. Kaila prep. 3998; **38.** *E. lagotara* Kaila & Sruoga, sp. nov., holotype, L. Kaila prep. 6159; **39.** *E. lagotara* Kaila & Sruoga, sp. nov., paratype, L. Kaila prep. 1515.

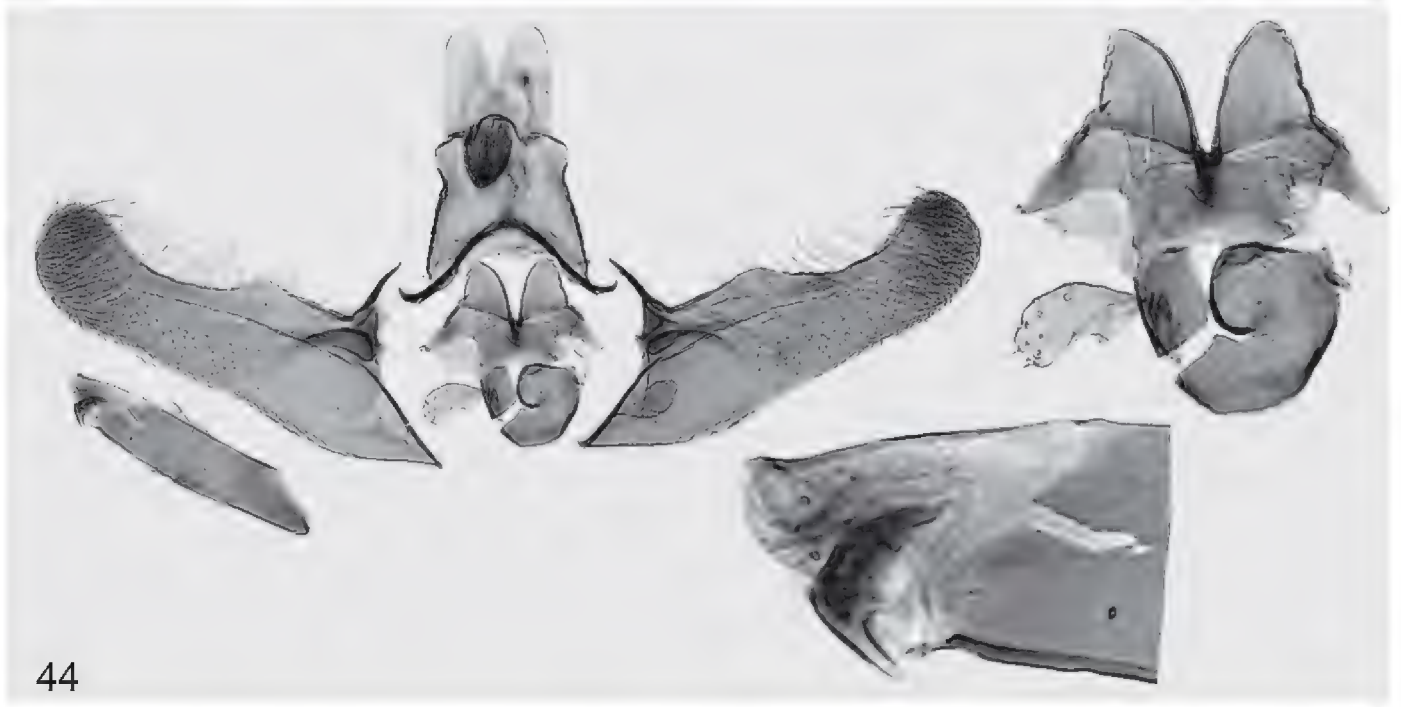


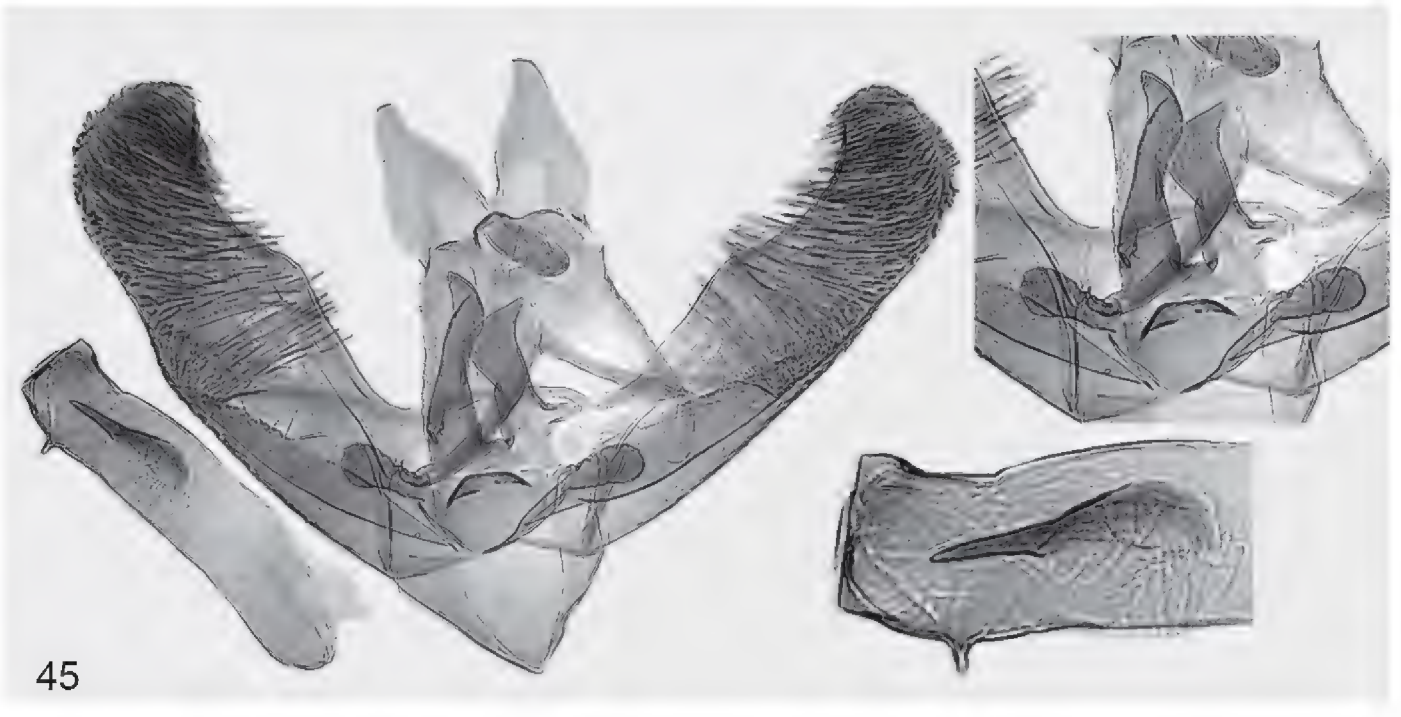



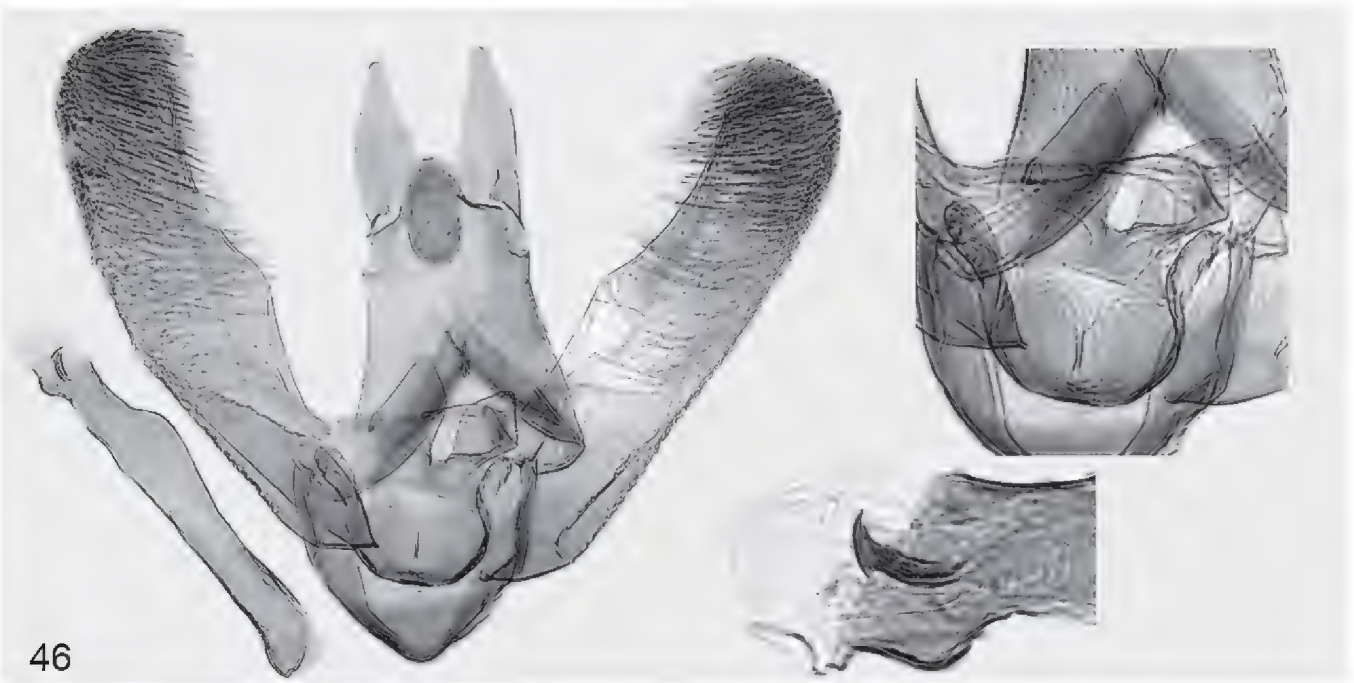

**Figures 40–42.** Male genitalia of *Elachista* spp. Left: general image of genitalia, phallus in same scale. Right top: juxta and digitate process. Right bottom: cornutus as enlarged. **40.** *E. latipenella* Sinev & Budashkin, L. Kaila prep. 3399; **41.** *E. scolopsa* Kaila & Sruoga, sp. nov., holotype, L. Kaila prep. 6146; **42.** *E. belona* Kaila & Sruoga, sp. nov., holotype, L. Kaila prep. 2198.



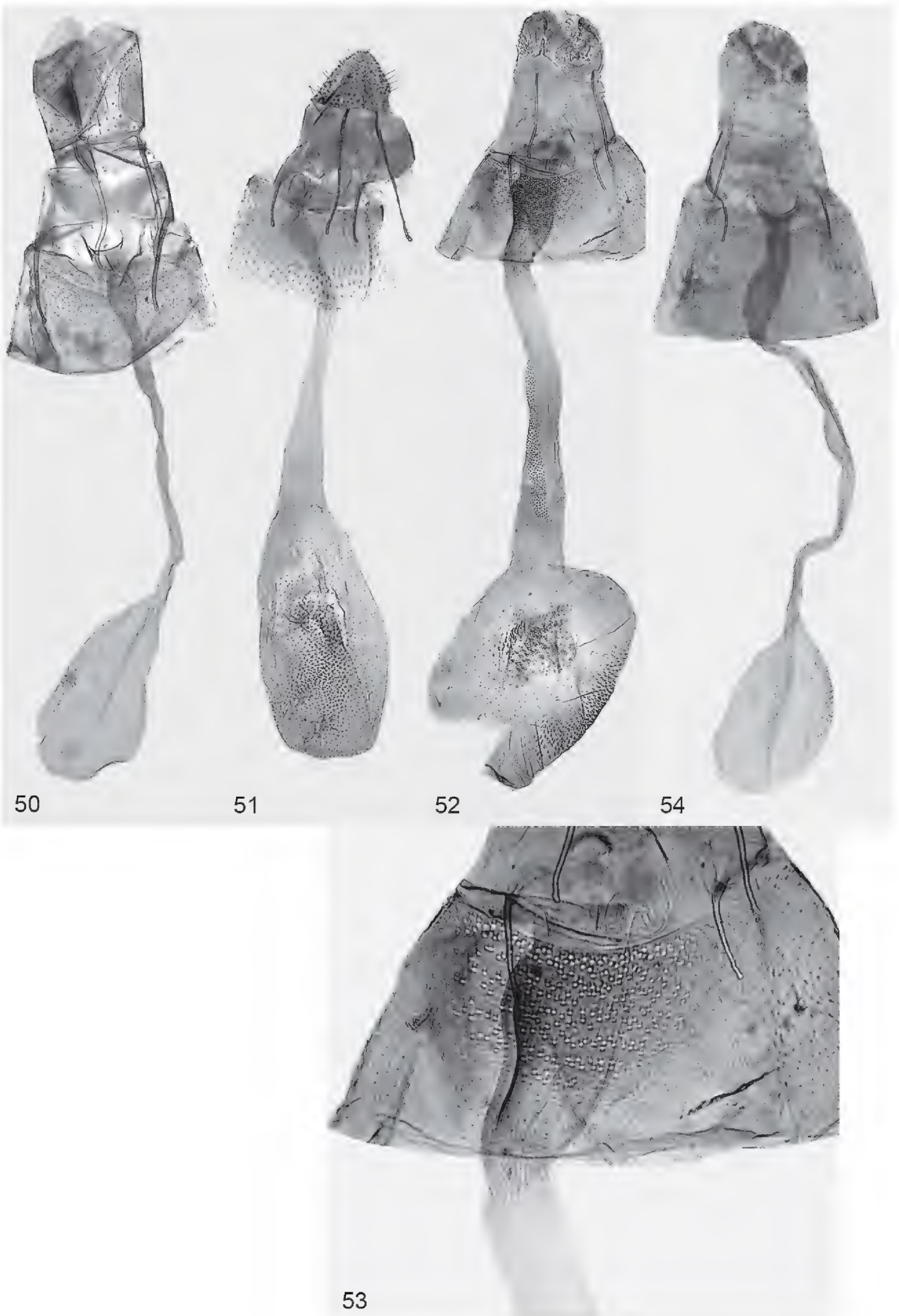



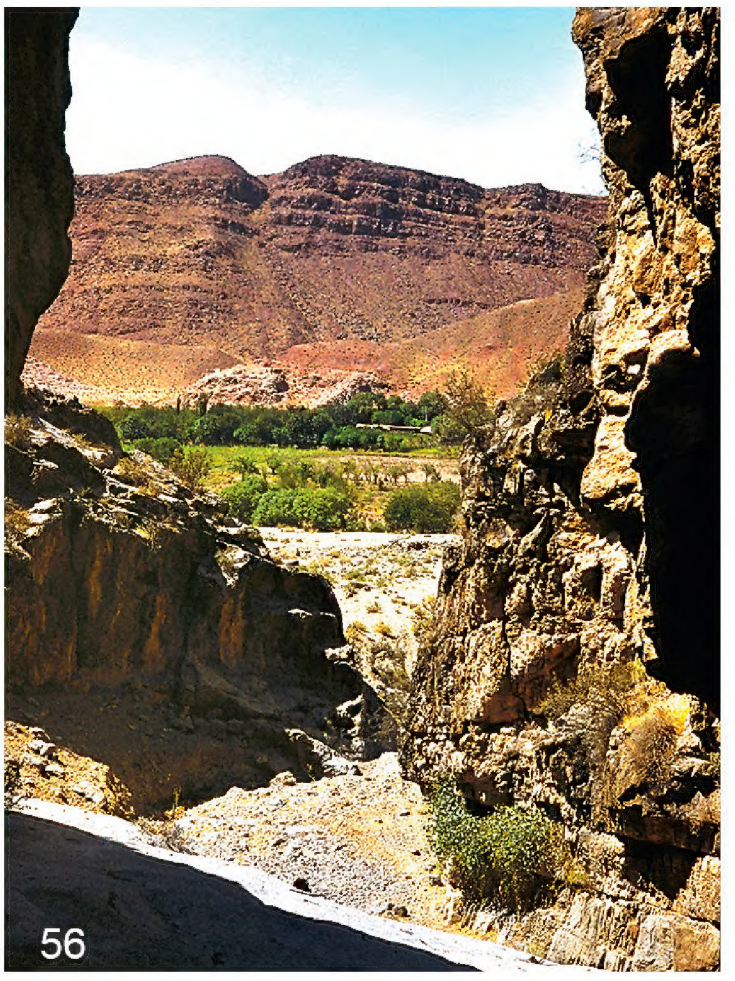

**Figures 43–45.** Male genitalia of *Elachista* spp. Left: general image of genitalia, phallus in same scale. Right top: juxta and digitate process. Right bottom: cornutus as enlarged. **43.** *E. belona* Kaila & Sruoga, sp. nov., paratype, L. Kaila prep. 4434; **44.** *E. derbendi* Parenti, holotype, U. Parenti prep. 2200; **45.** *E. rudectella* Stainton, L. Kaila prep. 4313.



**Figures 46–49.** Genitalia of *Elachista* spp. **46.** Male genitalia of *E. nolckeni* Šulcs, L. Kaila prep. 3313. Left: general image of genitalia, phallus in same scale. Right top: juxta and digitate process. Right bottom: cornutus as enlarged; **47.** Female genitalia of *E. multipunctata* Sruoga, V. Sruoga prep. VS157; **48.** Female genitalia of *E. graeca* Parenti, L. Kaila prep. 4433; **49.** Female genitalia of *E. lagotara* Kaila & Sruoga, sp. nov., paratype, V. Sruoga prep. VS199.




**Figures 50–54.** Female genitalia of *Elachista* spp. **50.** *E. belona* Kaila & Sruoga, sp. nov., paratype, L. Kaila prep. 4419; **51.** *E. derbendi* Parenti (with reservation of conspecificity), U. Parenti prep. 1004; **52.** *E. rudectella* Stainton, L. Kaila prep. 6149; **53.** Same slide, antrum (enlarged); **54.** *E. nolckeni* Šulcs, L. Kaila prep. 6382.



**Figures 55–58.** Sampling habitats in Central Asia. **55.** Tajikistan, 30 km N Dushanbe, Kondara; **56**. Southeastern Turkmenistan, Kugitangtau Mts.; **57.** Southwestern Turkmenistan, Kopet Dag Mts., 40 km E Garrygala, in spring; **58.** Same locality, in summer.

***Female genitalia.*** Papilla analis membranous with nearly round apex; ventrally fused with inverted Y-shaped connecting sclerotization. Apophysis posterioris about 1.5 × as long as papilla analis. Apophysis anterioris approximately 0.5 × as long as apophysis posterioris. Ostium bursae relatively narrow, round, ventral margin sclerotized. Colliculum long and broad, width almost 1/4 its length. Ductus bursae about 3 × as long as colliculum, narrow and membranous, with spines from middle to corpus bursae. Corpus bursae covered with two indistinct bands of small internal spines; no signum present.

**Biology.** Larval host plant(s): *Phleum phleoides* (Baran 2002).

**Distribution.** Austria, Czech Republic, Estonia, France, Germany, Georgia, Italy, Latvia, Poland, Russia (European part, southern Ural, Caucasus), Slovakia, Spain, Switzerland, Ukraine (Kaila 2019).

**DNA barcode information.** Maximum intraspecific divergence distance (n = 23) 1.43% (sample id's: BC ZSM Lep94917; DNA voucher FinBOL 2021 http://tun.fi/NH.467, 467; DNA samples KLM Lep15568; DNA sample 25479 Lepid. Phyl.; TLMF 11086, 12301, 12316, 12333, 14952, 16592, 19472, 15331, 15381, 15466, 16809, 18122, 18123, 18446, 18556, 23717, 26223, 27725, 27797, 33418). Nearest neighbour is *E. rosselloensis* Nel & Varenne, 2019 with 5.08% divergence.

**Remarks.** Baran (2002) gave a detailed account of identification, immature stages and ecology of *E. nolckeni*.

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